BUREAU OF HYGIENE AND TROPICAL DISEASES.

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HELMINTHIASIS.

LEIPER (R. T.). **Landmarks in Medical Helminthology.**—*Jl. Helminthology.* 1929. June. Vol. 7. No. 2. pp. 101–118.

This closely written historical survey cannot be satisfactorily abstracted. Tapeworms, ascaris and female threadworms were known long before HIPPOCRATES to Europeans at least, guineaworm in 1598, and the internal structure of *Ascaris lumbricoides* in 1683. An outbreak of mucous fever lead to the discovery of the whipworm in 1760. Hydatids were shown in 1782 by their hooks and suckers to be related to tapeworms. Measly pork was known in 1276. RUDOLPHI at the beginning of the nineteenth century was a strong supporter of the doctrine of spontaneous generation of worms. The male threadworm was first described by BREMSER in 1819. Alternation of generation in distome parasites was put forward by STEENSTRUP in 1842, who linked together many isolated facts. In 1850 HERBST began experimental helminthology by transmitting *Trichinella spiralis* in feeding experiments. KÜCHENMEISTER in 1852 showed by such means that bladderworms became tapeworms and at this time BILHARZ discovered blood flukes. The value of routine microscopic faecal examination for helminth eggs was first recognized by DAVAINE in 1857. FEDTSCHENKO traced the life history of the guineaworm in 1870. Timothy LEWIS reported microfilariae in the blood in [1874]. In 1876 BANCROFT found the adults in a lymphatic abscess, and in 1877 MANSON announced their development in *Culex fatigans*, but their return to man had to wait till 1900 for its demonstration by LOW. MCCONNEL demonstrated *Distoma sinense* in the bile ducts of Chinese in Calcutta in 1875, and LEWIS and MCCONNEL in 1876 named *Amphistoma hominis* from specimens which had lain undescribed in the Medical College, Calcutta, for 22 years. In 1877 *Anguillula stercoralis* and *A. intestinalis* were found by NORMAND, LEUCKART showing in 1882 that they were succeeding phases in the development of the same species. In 1878 RINGER found a pulmonary fluke and in 1880 COBBOLD, who received it through MANSON, named it *Distoma ringeri*; this constituted the first record of paragonimus infection. PERRONCITO established the hookworm about this time as the cause of miners' anaemia and BOZZOLO introduced thymol as its treatment in 1881. *Diphyllobothrium latum* had its life history partly solved by BRAUN in 1882, MANSON having

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discovered a larval stage of this type of worm in 1881, named *Ligula mansoni* by COBBOLD in 1883. Bothriocephalus anaemia was described by BOTKINE in 1885, the oral route of hookworm infection by LEICHTENSTERN in 1887 and of *Strongyloides stercoralis* in 1890, embryos of *Filaria diurna* and *Filaria perstans* by MANSON in 1891. GRASSI and ROVELLI in 1892 traced *Taenia flavopunctata* through the rat flea and *T. nana* forming cysticerooids directly in the intestinal villus. *Filaria volvulus* in subcutaneous nodules was identified by LEUCKART in 1893, the skin infection of *Ancylostoma duodenale* established by Looss in 1898, *Necator americanus*, a new hookworm of man, by STILES in 1902. The lateral spined schistosome egg was noted by MANSON in 1902, and the Japanese blood fluke by KATSURADA in 1904. In 1912 Leiper showed that Loa developed in two species of Chrysops. The work of the Rockefeller Foundation, and the history of the discovery of an intermediate host of the schistosomes by MIYAIRI in Japan, and by Leiper in Egypt, are noted, and the way in which the latter proved the existence of the separate adult forms *S. haematobium* and *S. mansoni*. There are mentioned the use of antimony tartrate by CHRISTOPHERSON and emetine by DIAMANTIS in 1918 for the treatment of schistosomiasis, the tracing of the life history of paragonimus by NAKAGAWA in 1914, the pulmonary route of ascaris infection by STEWART in 1916, the life cycle of *D. latum* completed by ROSEN in 1917, the complement deviation test for schistosomiasis by FAIRLEY in 1919, the life history of *F. buskii* in 1920 by NAKAGAWA, of heterophyes by ONDI and NISHIO in 1923, of *Onchocerca volvulus* by BLACKLOCK in 1926 and *F. perstans* in 1927 by Dyce SHARP. That *Ligula mansoni* can enter wounds from split frogs used as a poultice was shown by FAUST in 1928. Recent treatment of hookworm infection with carbon tetrachloride and tetrachlorethylene is mentioned.

Clayton Lane.

CARMAN (John A.). **Observations on the Incidence of Helminthic Infestations in Natives of Kenya, with Special Reference to Taeniasis, its Effect on Nutrition and its Treatment with Carbon Tetrachloride.** —*Jl. Trop. Med. & Hyg.* 1929. Nov. 15. Vol. 32. No. 22. pp. 321–328. [38 refs.]

"(1) Examinations of the reformatory and prison inmates in the highlands of Kenya revealed the following facts :—

"(*a*) A high incidence, 57·9 per cent. of light infestations with hookworm.

"(*b*) An incidence of *Taenia saginata* of 50 per cent. in children and 77·2 per cent. in adults.

"(2) In Africa the diagnosis of taeniasis may be conveniently and accurately made by washing whole stools after purgation and searching for segments.

"(3) Carbon tetrachloride in graduated doses up to 4 cc. gave an efficacy of 76·1 per cent. cures in light infections with hookworms and of 97 per cent. against light infections with *T. saginata*. Combined with oil of chenopodium the efficacy against heavy infections of *Taenia* was 69·5 per cent.

"(4) In view of the digested state of tapeworms passed after treatment with carbon tetrachloride, it is suggested that this drug may act by upsetting the power normally possessed by this parasite of resisting the action of the intestinal enzymes.

"(5) The drug should not be used in the mass treatment of a debilitated population unless all patients can be interrogated as to their present condition and recent illnesses.

" (6) Nutrition is definitely shown to be adversely affected by the presence of infestations with *Taenia saginata* in growing boys, a fact which is demonstrated by a consideration of the rates at which they gained in weight before and after treatment."

C. L.

i. Chesneau (Pierre). L'helminthiase au Cammon, province du Moyen-Laos. [**Helminth Infestations in Middle Laos.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1929. June & July. Vol. 7. Nos. 6 & 7. pp. 289–303; 342–351. With 1 map in text. Also in *Ann. de Méd. et de Pharm. Colon.* 1929. July–Aug.–Sept. Vol. 27. No. 3. pp. 369–390.

ii. Genevray (J.). Helminthiase chez les tirailleurs Tonkinois. [**Helminth Infestations in Tonkin Tirailleurs.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1929. July. Vol. 7. No. 7. pp. 339–341. [Pasteur Inst., Hanoi.]

i. Stools were brought to a central laboratory in 2 per cent. formalin solution, and there examined by smear. They totalled 2,470 and 82·6 per cent. contained parasites. The species percentages were as follows: Ascaris 63, hookworms 26·7, trichuris 32·9, enterobius 0·4, strongyloides 1·1, *T. solium* 2·2, *T. saginata* 0·2, opisthorchis 15·9, *Fasciolopsis buskii* 0·7. The distribution by age, sex and district are also given.

ii. In a single examination, presumably a smear, from each stool of 1,000 healthy tirailleurs, infections found were: Ascaris 71·6, trichuris 41·5, hookworms 16·6, *Clonorchis sinensis* 1·4, tapeworms 0·9.

C. L.

i. Vogel (Hans). Helminthologische Beobachtungen in Ostpreussen, insbesondere ueber *Dibothriocephalus latus* und *Opisthorchis felineus*. [**Helminthological Observations in E. Prussia, especially on** *D. latus* **and** *O. felineus*.]—*Deut. Med. Woch.* 1929. Sept. 27. Vol. 55. No. 39. pp. 1631–1633. With 2 text figs. [1 ref.] [Inst. for Ship & Trop. Diseases, Hamburg.]

ii. ——. Beobachtungen ueber *Dibothriocephalus latus*.—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Vol. 33. No. 3. pp. 164–167 (248–251).

i. Vogel examined 25 stools in East Prussia by Telemann's method and found these infections: *Diphyllobothrium latum* 8, ascaris 13, *Opisthorchis felineus* 2, trichuris 21. It is believed that all adults of the region are affected with the broad tapeworm, but anaemia was not observed; 5 of 9 dogs were infected in Rossiten. *Diaptomus vulgaris* is implicated as a new first larval host, and infection passes to man through his eating the imperfectly cooked liver of the burbot; it is thought that this liver therapy may conduce to preventing anaemia. Dog and cercopithecus were artificially infected. Tench, roach, and bleak act as larval hosts to *O. felineus*, the first being particularly susceptible.

ii. Investigation of a considerable number of stools showed 36 per cent. infected with *D. latum*, while taking adult fisher folk only the percentage was 100. The burbot liver, it appears, is spread raw on bread and butter, and eaten seasoned with salt and pepper. Infected children (the youngest was 6) were pale and poorly nourished, but typical anaemia was not found, and is held to be due neither to toxic strains of

worm nor to the liberation of toxins by its decomposition, but to the disposition of the host ; and as regards the suggestion that it is eating liver which aids in preventing anaemia it is noted that six men in the Navy who had acquired the broad tapeworm in their East Prussian home, and had there suffered from no anaemia, did so suffer during their naval service. Evidence is also given that the worm may cause gastro-intestinal catarrh.

C. L.

Ortiz de Landazuri (A.). Parasitismo intestinal en un grupo de niños. Algunos datos de interés relacionados con su diagnóstico y tratamiento. [**Intestinal Parasites among a Group of Children.**]—*Medicina Países Cálidos.* Madrid. 1930. Mar. Vol. 3. No. 2. pp. 138–147. [10 refs.] French summary.

Examination by Willis's method of the stools of 100 children between the ages of 7 and 13 years revealed 38 with helminthic infestation. Eleven of these had hymenolepis ; they had lived all their lives in Madrid. Treatment with oil of chenopodium did not prove effectual, but after male fern—two treatments at 30 days' interval—the ova were no longer seen in ten of them. Other infestations were : Trichuris 14, giardia 11, oxyuris 3, strongyloides 2. Eosinophilia was not a marked feature ; it was found in 10 only, and in them to a varying degree. Using a 50 per cent. sugar solution, he found that eggs of taenia, ankylostome and strongyloides floated and this solution yielded the same intensity of eggs as the concentrated salt solution.

H. H. S.

Bacigalupo (Juan). Estudio helmintológico de 100 apéndices de extirpación quirúrgica. [**Helminthological Examination of 100 Excised Appendices.**]—*Prensa Méd. Argentina.* 1930. July 10. Vol. 17. No. 4. pp. 252–255. [4 refs.]

Twenty-six were from men, 74 from women. Of the former, 4 contained worms, of the latter 21. Enterobius was found altogether in 24 ; in 18, female worms only were present, in 5 both males and females, in one a male only ; the number of worms varied between 1 and 17. One appendix contained a solitary trichuris. Of the patients whose appendices contained parasites 5 were under 20 years, 11 between 20 and 30, and 9 over 30.

H. H. S.

Fülleborn (F.) & Kikuth (W.). Ueber Cutanreaktionen bei Helmintheninfektionen. [**Skin Reactions in Helminth Infections.**]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Vol. 33. No. 3. pp. 168–171 (252–255).

—— & ——. Ueber die Allergie des Menschen gegenüber Ascaris. [**Allergy in Man against Ascaris.**]—*Klin. Woch.* 1929. Oct. 22. Vol. 8. No. 43. pp. 1988–1995. [29 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

That parasitic worms equally with bacteria produce a toxin to which the body reacts with an antitoxin is instanced by the Casoni reaction for hydatid, Fülleborn's reaction for strongyloides, and that for schistosomiasis associated with the names of Fairley, Williams and

MANSON-BAHR. Yet for a number of worms such a reaction is not more than a group one. The authors discuss more fully the question of ascaris, obtaining their material from the pig. Of 58 persons the intradermal reaction was positive in 13, but in 8 only was there a history of previous or existing ascaris infection or sensitization. The authors were able to activate passively the skin of non-sensitive persons with the serum of patients showing a high ascaris sensibility. (Positive Prausnitz-Küstner experiment.) It is pointed out that the ascaris antigen is protein-free and lipoid-free and is not destroyed by heating, while the antibody is so destroyed at 56°C. maintained for three hours. The antibody loses its effect if mixed *in vitro* with antigen. At their suggestion WESTENDORFF showed that the cutaneous reaction failed in six cases of deep narcosis, corresponding with the observation that a sensitized animal deeply anaesthetized will withstand a dose of antigen which would otherwise be fatal, and falling in with KELLAWAY'S observation that anaphylactic shock is frequently absent in an operation under deep anaesthesia for hydatid. The cutaneous reaction was stopped by ephedralin also. An experiment is described confirming the protein-free and lipoid-free character of the ascaris antigen.

A non-sensitive person could be sensitized by an intradermal injection of the antigen. The authors were not able to produce anaphylaxis either through subcutaneous, intraperitoneal or intravenous injections, or by inhalation. The Dale experiment with the uterus of a virgin guineapig was likewise negative. In two rabbits the subcutaneous injection of antigen produced complement fixation substance in their serum.

C. L.

SOROUR (M. F.). **Chronic Parasitic Funiculitis in Egypt.**—*Lancet.* 1929. Oct. 5. pp. 708–710. With 6 text figs.

Ten years' experience in examining pathological material sent to Cairo from all over Egypt shows that nodules up to the size of a pigeon's egg are not uncommon in the spermatic cords of fellaheen. They are caused by one of two helminthic infections, filarial or bilharzial. Sorour had recognized a chronic eosinophilic funiculitis for years, characterized by fibrosis, heavy eosinophil infiltration, and thickened blood vessels often thrombosed. A chance section revealed a filaria and re-examination of old material found the same "in each case." Nevertheless a second type of funiculitis caused by bilharzia ova is recognized, having the usual characters of bilharzial tumours.

C. L.

VON OETTINGEN (W. F.). **Comparison of Various Lactones with Santonin. I. Studies of Chemical Constitution and Pharmacological Action.**—*Jl. Pharm. & Experim. Therap.* 1929. July. Vol. 36. No. 3. pp. 335–354. With 3 figs. [23 refs.]

—— & GARCIA (F.). **The Toxicity and Vermicidal Properties of the Dilactone of Acetone Diacetic Acid and Beta Angelica Lactone in Cats. Dilactone and Beta Angelica Lactone as Anthelmintics.**—*Ibid.* pp. 355–362. [School of Med., Western Reserve Univ., Cleveland, Ohio.]

Since the importance of the lactone group in the santonin molecule is still unsettled, experimental studies on certain lactones were under-

taken. They are all depressant and lethal to earthworms. The "most effective" were investigated on ascarids of cats, namely β-angelica lactone and the dilactone of acetone diacetic acid. The former was very toxic to cats; the latter was tested for toxicity in four animals in doses of 1·0, 1·8, 2·3 and 2·6 gm. per kilo. There was no distinct effect in the first two, and slight depression in the second two. Accordingly, it was given as an anthelmintic to ten more in doses between 0·2 and 0·8 gm. per kilo. In 7 of the ten cats these doses removed all worms; in the others, 7 of 19, 24 of 53, and 5 of 6. The totals were checked by autopsy.

C. L.

Ross (I. Clunies). **Some Observations on the Bionomics of** *Fasciola hepatica.*—*Japanese Jl. Experim. Med.* 1930. Apr. 20. Vol. 8. No. 2. pp. 65–69. [6 refs.]

In Tokyo, Ross studied *Fasciola hepatica* developing in *Limnea pervia* for 79 days in summer and 64 days in autumn. With temperature between 24° C. and 32° C. or even 35° C. cercariae began to escape from snails in about 5 weeks, and were still doing so after 11, at which time very immature cercariae were still contained in rediae in dissected snails. With average temperatures between 15·5° C. and 20·5° C. for 33 days, and between 9·8° C. and 16·2° C. for the next 31, development produced almost no motile cercariae. It is reasonably inferred that, where the maximum temperature of water does not exceed 10° C. in winter time, development ceases. Daughter rediae were found numerously with the falling temperature of autumn, but cercariae were also present at that season in considerable number. Contrary to earlier observations, encystment of cercariae took place at relatively low depths, 18 of 250 being found below 4·5 cm. from the surface, 10 below 7·5 cm., and 6 on the bottom at 10·5 cm. This implies an increased likelihood of survival when shallow pools are drying up.

C. L.

Paul (Fritz). Lebergelseuche (Distomiasis hepatica) beim Menschen. [*Fasciola hepatica* **Infection in Man.**]—*Seuchenbekämpfung.* Vienna. 1928. Vol. 5. No. 2. pp. 119–129. With 8 text figs. [Kaiser Franz Josef Hosp., Vienna.]

In the autumn and winter of 1926 there was a heavy veterinary epidemic of illness caused by *Fasciola hepatica* with three human cases, of whom two died. One of the figures, that of a faecal smear, shows an egg of this parasite and two of trichuris.

C. L.

Krukow (A. N.). Le nouveau symptôme parmi les signes de la distomatose hépatique. [**An Additional Sign of Hepatic Distomiasis.**]—*Pensée Méd. d' Usbékistane.* Tashkent. 1927. Dec. No. 3. pp. 87–89. [In Russian. French summary p. 138.]

The summary states that in a woman of 30 with hepatic distomiasis a particular part of the liver would rapidly swell and as rapidly shrink. The condition is attributed to intermittent biliary obstruction by the parasites.

C. L.

Rajcevic (M.). Wie lange bleiben die Cerkarien der Leberegel (Distom hepaticum) am getrockneten alten Heu lebend und infektionsfähig ? (Ein Beitrag zur Ätiologie der Distomatosis.) [**Length of Life of Cercaria of Liver Fluke in Dried Hay.**]—*Deut. Tierärzt. Woch.* 1929. Aug. 24. Vol. 37. No. 34. pp. 535–537. [Vet. Faculty, Univ., Zagreb.]

In stacked hay cercariae of *F. hepatica* remained alive for at least 17 months, that is, for two summers and one winter. In the sheep investigated no rams were infected.

C. L.

Ryoji (S.). Therapeutische Studien ueber die Clonorchiasis. Experimentelle Studien ueber die therapeutische Wirksamkeit des Stibenyl, Stibosan und Antimosan auf Kaninchenclonorchiasis. [**Therapeutic Studies on Clonorchiasis in Rabbits.**]—*Okayama-Igakkai Zasshi* (*Zent. d. Okayama Med. Gesellsch.*). 1927. Nov. Vol. 39. No. 11 (No. 454). pp. 1809–1823. [6 refs.] [In Japanese. German summary pp. 1824–1825. With 6 figs. on 3 plates.] [Med. Clinic, Univ., Okayama.]

Stibosan and antimosan are a quarter as toxic to experimental animals as tartar emetic, and stibenyl is an eighth as toxic. *In vitro* against *Clonorchis sinensis* antimosan is the strongest and stibenyl the weakest of the series. *In vivo* stibenyl in dosage of 0·24 to 0·8 gm. per kilo and stibosan in total dosage of 0·24 to 0·48 gm. per kilo greatly damage the worms in the bile passages, but apparently, as judged by egg counts, do not lessen their numbers, whereas antimosan does not appreciably damage the worms, but greatly lessens their number [an anomalous result]. The liver changes found in treated cases were judged to be less than those found in controls. Antimosan is held to be four times as effective as stibenyl.

C. L.

Ross (I. Clunies). **The Effect of Large Doses of Carbon Tetrachloride in the Treatment of *Clonorchis* and *Schistosomum* Infestation in the Dog.**—*Japanese Jl. Experim. Med.* 1930. Apr. 20. Vol. 8. No. 2. pp. 71–78. [4 refs.]

As others have experienced, puppies died wholesale after carbon tetrachloride. A dog with *Schistosoma japonicum* died two days after receiving the last of ten treatments in 40 days, each at about the rate of 1 cc. per kilo or 10 cc. per kilo all together. A number of fertile and apparently normal worms were found at autopsy. Four dogs with clonorchis infection were given three doses, each dose varying between 1 cc. and 2 cc. per kilo. One survived to be killed ; the other three died, one as the direct effect of the drug getting into the air passages ; as regards the others, whether from the drug or the infection seems uncertain. The flukes were badly damaged. [Man has been killed by a thirtieth to a sixtieth of a single one of these doses per kilo.]

C. L.

Takahashi (Shozo). **On the Eggs of Several Kinds of Intestinal Trematodes, which resemble that of** *Clonorchis sinensis*, **especially the Eggs of** *Stellantchasmus falcatus* **and** *Pygidiopsis summus* **found in Human Stools. With a Supplement on the Examinations of the Helminthic Parasites of the Dogs and Cats in Okayama Prefecture.**—*Okayama-Igakkai Zasshi* (*Zent. d. Okayama Med. Gesellsch.*). 1929. July. Vol. 41. No. 7. pp. 1502–1512. With 9 figs. on 1 plate. [In Japanese. English summary p. 1513.] [Bact. Dept., Med. Univ., Okayama.]

"The eggs of *Stellantchasmus falcatus* were found in 1·5 per cent. and *Pygidiopsis summus* in 0·3 per cent. in the stools of the natives of Okayama district. No human case of these trematodes has yet been recorded in Japan, owing probably to the fact that the eggs of these trematodes resemble closely those of *Clonorchis sinensis*." The eggs concerned are illustrated by photomicrographs.

C. L.

Bedier (E.) & Chesneau (P.). Distomatose hépatique à *Opist*[*h*]*orchis* au Laos (à Vientiane et Thakhek). [**Opisthorchis Infection of the Liver in Laos.**]—*Bull. Soc. Path. Exot.* 1929. May 8. Vol. 22. No. 5. pp. 331–334. [3 refs.]

In three autopsies an *Opisthorchis* species was found sparsely in bile ducts. Opinion is reserved as to whether it is *O. felineus* or *O. viverrini*. The corresponding eggs have been found 322 times at Thakhek. The percentage of infections detected here seems to vary between 22·8 per cent. and 9·7 per cent. as judged by stool examination.

C. L.

Vogel (Hans). Beobachtungen ueber *Cercaria vitrina* und deren Beziehung zum Lanzettegelproblem. [*Cercaria vitrina* **and its Relation to** *Dicrocoelium lanceatum*.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Sept. Vol. 33. No. 9. pp. 474–489. With 7 text figs. [17 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

Practically all sheep in the Tyrol are infected with *Dicrocoelium lanceatum*. There are no water snails there, so that infection must be through land snails. In certain of the latter, namely, *Zebrina detrita* and *Helicella candidula*, there were found numbers of *Cercaria vitrina*. Its anatomy is described, and the resemblance of its anatomical arrangement to that of *D. lanceatum* is mentioned. The miracidium of the latter penetrates the gut of *Z. detrita* which has been fed with the eggs, but some second intermediate host is required to complete development.

C. L.

i. Matheson (Colin). **Notes on** *Cercaria elvae* **Miller as the Probable Cause of an Outbreak of Dermatitis at Cardiff.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. Jan. 30. Vol. 23. No. 4. pp. 421–424. [3 refs.]

ii. Mathias (Paul). **Sur** *Cercaria ocellata* **La Valette.**—*Ann. Parasit. Humaine et Comparée.* 1930. Mar. 1. Vol. 8. No. 2. pp. 151–160. With 3 text figs. [22 refs.]

iii. Vogel (Hans). Hautveränderungen durch *Cercaria ocellata*. [**Skin Changes caused by** *C. ocellata*.]—*Dermat. Woch.* 1930. Apr. 26. Vol. 90. No. 17. pp. 577–581. With 6 text figs. [7 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

iv. Taylor (E. L.) & Baylis (H. A.). **Observations and Experiments on a Dermatitis-producing Cercaria and on another Cercaria from *Limnaea stagnalis* in Great Britain.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. Aug. 8. Vol. 24. No. 2. pp. 219–244. With 18 figs. (16 on 8 plates). [21 refs.]

i. During the summer of 1928, bathers in a large artificial lake at Cardiff suffered within a few hours of bathing from a blotchy papular dermatitis, many papules having a central puncture-like point. Irritation was intense and scratching produced bleeding. Under some bathing costumes the skin was less affected than on exposed parts. The sufferers felt no bites, and no case occurred among the hundreds of non-bathers who passed that way. All pointed to the water as producing the rash, but investigation of the fauna and flora, including bacteria, of the lake gave no clue to the actual cause. Search of the literature disclosed Cort's report on *Cercaria elvae* as causing a dermatitis (this *Bulletin*, Vol. 25, p. 946). There had been a few cases in 1927. The epidemic reappeared with the bathing season of 1929, but was less extensive than it had been in the previous year, probably because there were fewer bathers, for the news had got round. Then the snail *Limnaea stagnalis*, apparently a recent addition to the local fauna, was found emitting cercariae, which were identified by Baylis as being of two kinds, one morphologically identical with *C. elvae*. This was further studied (iv).

ii. In the meantime Mathias found *C. ocellata* escaping from *L. stagnalis* and *L. limosa* and noted that the cercariae fixed themselves to the side of a vessel, and soon re-attached themselves if disturbed. They lived 60 to 65 or even 69 hours, attached themselves rapidly to the skin of fowl or duck and forthwith cast their tails.

iii. Vogel further found that *C. ocellata* usually emerged from the snail about midday and had a strong attraction to light. Following the sacrificial tradition of his laboratory, he applied 34 cercariae to a limited area of his own skin, had this portion cut out 24 hours later, and displayed by serial sections 11 cercariae still in the epidermis. One was surprised on the point of entering the dermis, as the missing ones had probably done and left the area of investigation.

iv. Taylor and Baylis, while drawing attention to ii and iii, note that their observations were made independently and without knowledge of this work, and that they confirm it. They point out that *C. elvae* Miller, 1923, is probably identical with, and so must give way in nomenclature to, *C. ocellata*, La Valette, 1855. They found that the cercariae had so strong a negative geotropism that they could not satisfactorily be concentrated by centrifugal precipitation. This character, with that of phototropism, point to some surface-swimming animal as the proper definitive host. This host was not discovered, but the cercaria closely resembles *Bilharziella polonica* which, as adult, inhabits the mesenteric veins of ducks. The morphology of the cercaria is beautifully illustrated in drawings by Miss Rees. Cercariae penetrated mouse skin after casting their tails, and in human skin produced a ground itch persisting for weeks, but no creeping eruption. The other form, "Cercaria X," does not annoy man, but enters small fish and reaches the optic lens.

C. L.

SUDAN. **Report on Medical and Health Work in the Sudan for the Year 1928** [ATKEY (O. F. H.) Director, Sudan Med. Service].—115 pp. (Bilharziasis : pp. 15–22.)

The campaign against schistosomiasis includes quarantine stations, the prevention of fouling of water, destruction of snails, and treatment. The infection is rare in the south, but has been detected at Yei, near the Sudan-Congo-Uganda border. It was noted in Berber that where the intake into irrigating canals was in deep water few snails are distributed ; the matter is being investigated ; infection in school children is less than a fifth of its incidence in 1926. In Dongola there is increased willingness to come for diagnosis and treatment. In the White Nile province, snails, mostly planorbis, are mainly found in the shallow edges of the slow-flowing river, where they cannot in the ordinary way be destroyed, and 50 per cent. are infected. Ducks were avid snail eaters, but apparently could not cope with the numbers in the Blue Nile province ; and there snails are rapidly increasing. A combination of all forms of possible defence is being carried out.

C. L.

SINDERSON (H. C.). **Anomaly of Pigmentation in Schistosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. Apr. 17. Vol. 23. No. 6. pp. 633–634. With 1 plate.

About 20 per cent. of schistosomiasis cases admitted to the Royal Hospital, Baghdad, show a " butterfly " pigmentation on the face—a darkish brown pigmentation on both cheeks and " along the bridge of [? or] lateral aspects of the nose." Its presence has caused urinary examination with discovery of ova in the urine. *S. haematobium* is the only species in Iraq. The butterfly sign is much rarer in females than in males.

C. L.

SAVERIO (Cerqua). Appendicite da bilharzia. [**Bilharzial Appendicitis.**] —*Arch. Ital. Sci. Med. Colon.* 1930. June 1. Vol. 11. No. 6. pp. 325–327. With 2 text figs. English summary (3 lines). [Umberto I. Italian Hosp., Cairo.]

Sudanese, 30 years of age, suffered with acute abdominal pain, vomiting and extreme meteorism. Appendicitis was diagnosed and operation performed. The excised appendix showed nodules, in the serous aspect of which were many calcified ova of *S. haematobium* ; the submucosa and muscularis mucosa were fibrotic and contained ova, also calcified.

H. H. S.

CAWSTON (F. G.) **The Rapid Cure of Schistosomiasis.** [Correspondence.] —*Lancet.* 1930. July 12. p. 108.

Two cases are noted where neoantimosan or fouadin produced late vomiting and gastric disturbance. In one the drug had to be discontinued after the third dose, in the other 53·5 cc. were given in 31 days. Normal ova of *S. haematobium* were present in the urine three months later, and it was frequently bloody. Africans were undisturbed by the treatment. The makers reported that a sample from the batch of drug which had produced these symptoms had not altered in composition.

C. L.

KHALIL (M.) & SALAH EL DIN (M.). **The Microscopical Diagnosis of Intestinal Schistosomiasis.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. Mar. 17. Vol. 23. No. 5. pp. 519–524. [3 refs.]

The diagnostic methods used were: (1) The selected smear. The laboratory must receive the whole stool, and a portion containing mucus or blood must be lightly scraped with a flattened glass rod and examined as a watery suspension. (2) The precipitation method. With Khalil's floatation in concentrated salt solution in an Erlenmeyer flask the fluke eggs sink, and are removed by a pipette to a slide. "One preparation will suffice for detecting ancylostoma and schistosoma eggs." [In the abstractor's observation, the validity of which seems never to have been controverted, only a small fraction of the hookworm eggs present are recovered from the surface of fluid in an Erlenmeyer flask.] (3) The rectal swab. The mucus adhering to an unvaselined rubber finger-covering inserted into and scraping the rectum is examined. All 3 methods were used in 58 cases; 54 were positive to 1 rectal swab, 46 to two precipitation examinations and 41 to two smear examinations. In one case the swab was negative, while ova were present in one of the other methods.

C. L.

OZAWA (Makoto). **Experimental Study on Acquired Immunity to Schistosomiasis Japonica.**—*Japanese Jl. Experim. Med.* 1930. Apr. 20. Vol. 8. No. 2. pp. 79–84. [16 refs.]

Immunization was attempted by infecting dogs and curing them with stibnal, by injecting a suspension of adult worms, and by injecting one of cercariae. Dogs which have been infected and cured or injected as described may become infected subsequently, but the symptoms are milder and fewer worms mature than in controls, while many worms show very poor growth.

C. L.

CAWSTON (F. G.). **Schistosomiasis bovis in South African Sheep, Cattle and Man.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. Apr. 17. Vol. 23. No. 6. pp. 641–642. [4 refs.]

S. bovis has caused mortality in sheep in the eastern Province of the Cape and close to Pretoria in the Transvaal, and in man in Durban, Natal. Its distribution appears to coincide with that of *Physopsis africana* in the Union of S. Africa. Tartar emetic has been successfully given to sheep and cattle in Cape Province for schistosomiasis.

C. L.

LI (H. C.). **The Life Histories of *Diphyllobothrium decipiens* and *D. erinacei*.**—*Amer. Jl. Hyg.* 1929. Nov. Vol. 10. No. 3. pp. 527–550. With 38 figs. on 5 plates. [8 refs.] [Peking Union Med. College, Peking, China.]

Both cestodes use as first larval host any of the 8 local cyclops species, and also *C. affinis*; the second larval host of *D. decipiens* is the frog and of *D. erinacei* the hedgehog. The whole development is fully described and clearly illustrated. A point of more general interest is that a cyclops has swallowed as many as 60 oncospheres in 15 minutes.

Such greed is deservedly fatal ; but cyclops may harbour 10 or 12 procercoids and yet live for some time—indeed, 55 days was noted—and one was dissected 5 days after infection with 27 procercoids. But with these heavy infections, most die in 2 or 3 days.

C. L.

Motais (F.). Considération sur la pathogénie de la sparganose oculaire. [**The Pathogeny of Ocular Sparganosis.**]—*Bull. Soc. Méd.-Chirurg. Indochine.* 1929. July. Vol. 7. No. 7. pp. 363–368.

A note on the transmission of *Sparganum mansoni* with biological and historical interest. The paper tells that all medical men in Indochina who have met with sparganum infection have remarked on its limitation in man to the ocular region, though in animals it is found in all parts of the body. In the Society's Bulletin for September, 1926, Collin suggested that this was due to washing in polluted water. At its meeting in May, 1927, Casaux presented a woman who had been in the habit of applying beheaded and dismembered frogs to her eyes, and noted that the custom of natives of applying such frogs over the eyes, coupled with the bodily distribution of spargana in man, suggested that there was direct entry of these into the orbital tissues. In 1927 the thesis for doctorate of Evanno, Veterinary Inspector, arrived at like conclusions. He placed a sparganum in the conjunctival sac of a monkey, and recovered it 11 days later in the upper lid. Motais now recounts four cases of ocular sparganosis. In one, a week after application of a split frog to each eye, the eyes began to itch ; eight spargana were removed from the lids ; in the others like histories and findings were reported. The Hanoi section of the society, at whose meeting on July 25th, 1929, this paper was read, unanimously agreed to the sending to the Governor of a letter urging that steps should be taken to stop this disgusting and dangerous form of poulticing. [To complete the story, Faust in December, 1928, wrote, as noted in this *Bulletin*, Vol. 26, p. 539, that evidence not yet conclusive favoured the view that the application of frogs to inflamed and ulcerated parts introduced sparganum ; and again in March, 1929, Faust reported that the normal intermediate host of *D. mansoni* is *Rana esculenta*, and that Campbell had removed spargana from the fingers of two patients who had poulticed them with split frogs.]

C. L.

Joyeux (Ch.) & Baer (J. G.). Etudes sur le réencapsulement du *Sparganum ranarum* (Gastaldi, 1854). [**Re-encapsulation of** *S. ranarum.*]—*C.R. Soc. Biol.* 1929. Oct. 25. Vol. 102. No. 27. pp. 305–307.

The sparganum of *Diphyllobothrium ranarum* is frequent in snakes in the Mediterranean basin and becomes readily re-encapsuled in cold-blooded vertebrates. The hedgehog carries *S. ellipticum*, Molin, 1858 ; no other warm-blooded vertebrate carries a sparganum in this area. *Sp. ranarum* was fed to two, just imported, English ferrets, there being no infection in England ; they did not grow to adult form, but re-encysted in the intercostal muscles or adjacent subcutaneous tissue, having grown to as much as 7 mm. in length. When fed to dogs, however, adult *D. ranarum* was found in the intestine. The authors

comment on the absence of evidence of bacterial infection when sparganum penetrates. Moreover, they found that on adding spargana to culture tubes of the intestinal contents of a snake, there were after 24 hours half as many bacteria, of *Bact. coli* type, as in control tubes. They point to this as explanation of the rarity of infectious [bacterial] complications after infection with *S. mansoni*.

C. L.

Spindler (L. A.). **On the Occurrence of the Rat Tapeworm** (*Hymenolepis diminuta*) **and the Dwarf Tapeworm** (*Hymenolepis nana*) **in Man in Southwest Virginia.**—*Jl. Parasit.* 1929. Sept. Vol. 16. No. 1. pp. 38–40. [4 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

In 2,152 faecal examinations made by Stoll's method the eggs of *H. diminuta* were found once and those of *H. nana* 77 times, all but 3 being in children. The cases were found in community, but not in family, groups. The eggs can be recovered from the soil for 4 to 8 days after being placed in it, but were not discovered in soil samples round the premises of infected families. Regarding rats, it is merely said, " No evidence was obtained in this survey which would indicate that rats were responsible for the spread of this parasite in southwest Virginia."

[Are rats free from infection there?]

C. L.

Oquiñena Echalecu (Francisco). La " Hymenolepis nana " en España. [*H. nana* **in Spain.**]—*Medicina Países Cálidos.* Madrid. 1929. July. Vol. 2. No. 4. pp. 305–333. With 4 text figs. [79 refs.]

——. Etudes sur l'*Hymenolepis nana* en Espagne.—*Ann. Parasit. Humaine et Comparée.* 1929. Nov. 1. Vol. 7. No. 6. pp. 469–476. [26 refs.] [Lab. of Parasit. & Trop. Path., Faculty of Med., Madrid.]

Examination of 2,199 persons showed an infection rate with *H. nana* of 6·67 per cent., that in 957 children under 14 being 12·95. In general no symptoms were detected. Treatment by oil of chenopodium requires frequent repetition. It is believed that in Spain infection is as a rule direct, though 10 per cent. of *Tenebrio molitor* fed with onchospheres became infected. Eosinophilia in 22 pure infections varied from 0 to 19. There was often some anaemia.

C. L.

Rodriguez Lopez-Neyra (Carlos) & Torres Lopez (Antonio J.). El *Hymenolepis nana* como parásito intestinal humano en España. [*H. nana* **as Intestinal Parasite of Man in Spain.**]—*Arch. Argentinos Enferm. Aparato Digest. y Nutric.* Buenos Aires. 1928. Vol. 3. No. 6. pp. 885–895.

Three more cases are recorded from Spain of infection by *H. nana*. The parasite, it is pointed out, is not uncommon in that country and requires patience to secure complete elimination. In a child born in Brazil it was associated with necator, and in another born in Spain with trichuris and enterobius.

C. L.

Kasakow (P. T.). Ueber die Verbreitung von *Hymenolepis nana* in Leningrad. [**Spread of** *H. nana* **in Leningrad.**]—*Russian Jl. Trop. Med.* 1928. Vol. 6. No. 9. pp. 588–596. [In Russian. German summary p. 597.]

H. nana has been found in 0·3 per cent. of examinations made in Leningrad; parasitism with it has progressively increased since 1923, as have other worm infections.

Measly pork is being increasingly found in the Leningrad slaughter houses. A campaign is urged.

C. L.

Bacigalupo (Juan). La evolución del *Hymenolepis nana*. [**Development of** *H. nana*.]—*Semana Méd.* 1928. Jan. 26. Vol. 35. No. 4 (1776). pp. 200–201. With 2 text figs. [Central Military Hosp., Buenos Aires.]

The conclusion reached is that *Hymenolepis nana* of man and *H. nana* of the rat (*fraterna*) require for their evolution a secondary host, *Tenebrio molitor* or *T. obscurus*, and that these insects are infected as adults.

[These experiments show that *H. nana* may use an insect host. For evidence that development may proceed without one see this *Bulletin*, Vol. 21, p. 551—*bis*.]

C. L.

Bacigalupo (J.). *Hymenolepis nana* Von Siebold, 1852 et *Hymenolepis fraterna* Stiles, 1906. [*H. nana* **and** *H. fraterna*.]—*C.R. Soc. Biol.* 1929. Vol. 102. No. 36. pp. 1102–1103. With 2 text figs.

Bacigalupo holds *H. nana* distinct from *H. fraterna* because, though the forms cannot be separated morphologically, *H. fraterna* produces cysts in 60 per cent. of *Tenebrio* species and *H. nana* in 10 to 16 per cent., and because when infection is direct *H. nana* has its cercocyst in the anterior portion of the intestine of the rat and *H. fraterna* in the posterior part.

C. L.

Bacigalupo (Juan). El *Dermestes peruvianus* Castelnau en la transmisión del *Hymenolepis diminuta* (Rudolphi). [*Dermestes peruvianus* **as a Transmitter of** *Hymenolepis diminuta*.]—*Semana Méd.* 1929. Aug. 22. Vol. 36. No. 34 (1858). pp. 559–560. With 2 text figs.

Dermestes peruvianus, a new intermediate host of *H. diminuta*, has been found infected in its larval stage both naturally and experimentally. The adult has not been found infected.

C. L.

Kipschidse (N.). Ein Fall von *Taenia flavopunctata*. [**Case fo** *T. flavopunctata* **Infestation.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. June. Vol. 32. No. 6. pp. 330–331. [Therap. Hosp. Clinic, State Univ., Tiflis, Georgia.]

Georgia (S.S.R.) appears to be a living helminthic museum. Hookworms infect 80 per cent. and other worms are varied and numerous. A man of 28 suffered from abdominal pain, epileptic fits, nausea, salivation and headache. Eosinophilia and the finding in the faeces of eggs of *T. flavopunctata* [*Hymenolepis diminuta*] led to the giving of male fern, passage of worms, and disappearance of eggs and all symptoms.

C. L.

Faust (Ernest Carroll). **A Study of the Rare Human Tapeworm, *Taenia confusa*, with a Report of the Fourth Case.**—*Southern Med. Jl.* 1930. Oct. Vol. 23. No. 10. pp. 902–906. With 14 figs. [4 refs.]

——. **The Life Cycle of the Rare Human Tapeworm, *Taenia confusa* Ward, 1896.**—*Proc. Soc. Experim. Biol. & Med.* 1929. Nov. Vol. 27. No. 2. pp. 94–95. [3 refs.] [Med. College, Tulane Univ., New Orleans.]

A worm passed after male fern differed from *T. saginata* in having an oval scolex, a pair of lateral elytra in the unsegmented neck, terminal proglottids longer and narrower, the uterine branches more clumped. Feeding of proglottids to a rabbit gave no infection, to a calf produced more than a thousand unarmed cysticerci considerably smaller than those of *T. saginata*. This is the fourth infection reported with *T. confusa*. It is held that this study shows adequate evidence for retaining *T. confusa* as a separate and distinct species of the *T. saginata* type; and that the few reports of its occurrence are explicable as isolated recognitions of a species which must be widespread, but unrecognized, in view of the few cases reported since Ward described it in 1896.

C. L.

Castellano (Temistocles), Orgaz (Jorge) & Luque (Fernando). Cisticercosis Bovis en el hombre? [**Cysticercus bovis in Man?**]—*Prensa Méd. Argentina.* 1928. Nov. 10. Vol. 15. No. 16. pp. 665–672. With 7 figs. [22 refs.]

A man of 53 who harboured *Taenia saginata* had about 50 subcutaneous nodules. One was excised and shown to be a cysticercus on whose scolex no hooks were detected.

C. L.

Eisenklam (I.). Ein Bandwurm als Inhalt der Gallenblase. [**Tapeworm in the Gall Bladder.**]—*Wien. Klin. Woch.* 1929. Aug. 8. Vol. 42. No. 32. pp. 1051–1052. With 1 text fig. [4 refs.] [General Hosp., Vienna.]

Acute cholecystitis shown by tenderness and rigidity in the right hypochondrium of a woman of 64 with jaundice led to operation. From the gall bladder was removed a taenia 30 cm. long. The literature is reviewed.

C. L.

Weber (Fr. W. A.). Ueber Bandwurmkuren. [**The Treatment of Tapeworm Infestations.**]—*Muench. Med. Woch.* 1929. Aug. 9. Vol. 76. No. 32. pp. 1336–1338.

The paper deals essentially with treatment. That advised is in the evening 1 or 2 aperient tablets and three red coloured capsules of oxural, and next morning 20 capsules of taenural and one or two more aperient capsules. Oxural appears to be a proprietary preparation containing almost non-toxic oil of chenopodium [ascaridole, however, one must conclude is both the toxic and the actively anthelmintic material] and taenural a combination of *Filix mas* and chenopodium. The doses of the drugs themselves seem nowhere stated.

C. L.

Margulis (S.). Anwendung der Duodenalsonde zur Tänienaustreibung bei Erwachsenen und Kindern. [**The Duodenal Tube in the Treatment of Taenia Infestation.**]—*Muench. Med. Woch.* 1929. Sept. 6. Vol. 76. No. 36. pp. 1510–1511. [4 refs.]

The duodenal sound is advised for the administration of male fern as giving better results with smaller doses than usual.

C. L.

Fitzpatrick (S. C.). **Hydatid of the Lung : an Analysis of a Series of Seventeen Cases.**—*Med. Jl. Australia.* 1929. Aug. 17. 16th Year. Vol. 2. No. 7. pp. 214–216.

A valuable clinical analysis difficult to abstract. Almost all small cysts were parabronchial or lay close to the hilum of the lung, but since all cysts tend in growth towards the periphery it is impossible to say exactly where the larger cysts arose. "Every patient with a ruptured cyst and 60 per cent. of those with unruptured cysts in this series had haemoptysis at some period," and in haemoptysis cases tubercle bacilli may be reported. In unruptured cysts thoracotomy, evacuation and drainage were carried out in one stage under general anaesthesia in those cysts which were basal and subpleural, with pleura generally adherent. If these conditions are not fulfilled surgery must wait on events. In deep cysts there remains the unsolved problem of how to influence the relations, biochemical and biophysical, between the cyst and the lung so that death of the cyst shall take place at an early stage. A number of questions are suggested for discussion.

C. L.

Dévé (F.). Kyste hydatique et cancer. [**Hydatid and Cancer.**]—*Ann. Parasit. Humaine et Comparée.* 1930. July 1. Vol. 8. No. 3–4. pp. 437–449. [40 refs.] [Summary appears also in *Bulletin of Hygiene.*]

A paper of much interest and importance, not only as regards the question of the association and possible aetiological connexion between hydatid and cancer, but as illustrating the value of negative evidence. Cases of vesical carcinoma in urinary schistosomiasis, the association of gongylonema with cancer in mice, recorded instances of *Distoma felineum* and cancer of the liver in man and "precancerous" biliary fibroadenoma in sheep infested with *Fasciola hepatica* led the author to study the recorded cases of hydatid and cancer in man. Of these he has collected 31 cases between 1868 and 1927. With a single exception of sarcoma of the pancreas (reported by Briggs in 1890), about which there was some doubt, in every case the organ involved was the liver, and in all but seven the patient was over 60 years of age. Analysis showed that the association was not more frequent than might be accounted for by mere coincidence ; also it is strange that though hydatids of lungs and other organs are not infrequent, no instances have been reported of malignant disease ascribed to the presence of the parasite, and, thirdly, though these cysts are far more common in domesticated animals their association with cancer has not been noted.

H. H. S.

Anderson (C. C.). **The Radiological Diagnosis of Hydatid Infection.**—*Brit. Jl. Radiology.* 1928. Nov. New Ser. Vol. 1. No. 11. pp. 428–434. With 6 figs. on 4 plates. [9 refs.]

The author's conclusions are as follows:

"Where there is sufficient contrast between the hydatid cyst and the surrounding tissues radiographic demonstration is a comparatively simple matter and the interpretation of the shadows obtained is not unduly difficult; but as the densities approximate one another diagnosis becomes a matter of considerable difficulty, resting mainly upon the disturbance of normal contours of organs. Undoubtedly in cases of abdominal infection pneumo-peritoneum should be of assistance in outlining the cyst in such a manner as to facilitate demonstration and diagnosis.

"The chief diagnostic point is the demonstration of circular, ovoid or elliptical shadows in patients who have lived in sheep-country or who are fond of animals, especially dogs, and accustomed to make much of them."

The beautiful reproductions of X-ray plates show the substantial grounds on which the conclusions are based.

C. L.

Corkill (Norman L.). **Hydatid Cyst of the Heart.** [Memoranda.]—*Brit. Med. Jl.* 1929. Oct. 5. p. 622.

A calcified cyst as large as a goose's egg, with wall 1 to 3 mm. thick, lay in the intraventricular septum and communicated through a small orifice with the left ventricle. The cyst contained antemortem clot. No cysts were found elsewhere. He died in his sleep, but was stated to have complained of "heart disease." No particulars of symptoms could be obtained. The body was that of an Iraqi from Baghdad.

C. L.

Dévé (F.) & Lessertisseur (M.). Kyste hydatique et diathermie. [**Hydatid Cyst and Diathermy.**]—*C.R. Soc. Biol.* 1929. Aug. 13. Vol. 101. No. 25. pp. 1061–1062. [3 refs.]

Arnone* of Palermo having claimed success with diathermy in the treatment of hydatid cyst, the authors subjected two cysts to the process for 4 hours and 20 minutes. They were excised from liver and lung of sheep. They measured 4 and 5 cm. by 2·5 cm., and were left covered with 2 cm. of tissue, or where this was absent were clothed in cotton wool soaked in saline. A thermometer was placed between them and arranged to lie in the centre of the heating system. Temperature was maintained at 46° C., except that it fell to 39° C. during a 5 minutes stoppage each hour made in the interest of the apparatus. The scolices remained active at the end and infected a rabbit readily, though not quite so readily as those from an untreated cyst. Diathermy is, then, not curative.

C. L.

Dévé (F.). Au sujet du processus histologique des géodes échinococciques périartérielles. [**Hydatid Periarterial Geodes.**]—*C.R. Soc. Biol.* 1929. Nov. 15. Vol. 102. No. 30. pp. 499–501. With 2 text figs. [3 refs.]

Bacaloglu *et al*† having thrown doubt on Dévé's statement‡ that a hydatid aneurism of the pulmonary artery in the lungs produced hydatid periarterial geodes or hard tumours with a central cavity, he reiterates his findings and conclusions and backs them with further microphotographs.

C. L.

* G. Arnone. La Cultura Medica Moderna. Palermo. 15th April, 1928. p. 181.

† *Ann. de Méd.* 1929. Oct. Vol. 26. p. 242.

‡ *C.R. Soc. Biol.* 1927. Vol. 97. p. 552.

Kellaway (C. H.), Fairley (N. Hamilton) & Williams (F. Eleanor). **The Filterability of Hydatid "Antigens."**—*Australian Jl. Experim. Biol. & Med. Sci.* 1928. Sept. 16. Vol. 5. Pt. 3. pp. 189–204. With 2 text figs. [10 refs.] [Walter & Eliza Hall Inst., Melbourne.]

The authors' conclusions are as follows. The methods of obtaining the membranes are described in the text.

"1. Ultra-filtrates from hydatid fluid in the pyroxylin membranes described (hardened in 50 per cent. and 60 per cent. alcohol) do not contain any antigenic substances detectable by complement fixation, anaphylactic or intradermal tests, nor do they give chemical reactions indicative of the presence of protein.

"2. With more permeable membranes (hardened in 70 per cent. and 80 per cent. alcohol) the ultra-filtrates obtained give positive Spiegler and haemochromogen reactions, react well in anaphylactic experiments, and give positive intradermal tests in patients infested with hydatid. They yield only feeble complement fixation reactions with positive hydatid sera.

"3. Though these last membranes do not permit the passage of protein when sheep serum is filtered through them, traces of sheep serum protein are shown to be present in ultra-filtrates from hydatid fluid."

C. L.

Cantani (F.). Contribution expérimentale au diagnostic biologique des kystes hidatiques dans l'homme. [**Biological Diagnosis of Hydatid Cyst in Man.**]—*Bol. Sezione Ital., Soc. Internaz. di Microbiologia.* Milan. 1929. Aug. Vol. 1. No. 8. p. 195.

After examination of 21 cases, 4 of which came to autopsy, Cantani concludes that the best antigen is human hydatid fluid with nothing added and with no special treatment. With this he has obtained a positive result in 20. The diagnostic technique he places highest is that of Ghédini Wemberg which depends on deviation of complement.

C. L.

Morenas (L.). A propos de la spécificité de la réaction de Casoni (intradermo-réaction hydatique). [**The Specificity of Casoni's Reaction.**]—*C.R. Soc. Biol.* 1929. Dec. 6. Vol. 102. No. 33. pp. 786–787.

A positive Casoni reaction was obtained in 2 cases. In the first there was a hydatid cyst on the under surface of the liver; two months after its removal by operation the reaction was negative. In the second, intervention showed that a suspected enlarged spleen was caused by Banti's disease, and the reaction is attributed to a *T. saginata* which, it was found, he harboured. Mention of a possible undetected hydatid is not made.

C. L.

Cuboni (Ettore). Intradermoreazione con liquido echinococcico in animali trattati con antigene echinococcico. [**Intradermal Reaction with Hydatid Fluid in Animals treated with Echinococcus Antigen.**]—*Bol. Istituto Sieroterap. Milanese.* 1929. Aug.–Sept. Vol. 8. Nos. 8 & 9. pp. 519–527. [7 refs.] German summary pp. 527–528.

The Casoni reaction, obtained by injecting 0·1 cc. of hydatic fluid into the dermis, was evident in guineapigs and rabbits after they had been sensitized by the injection of hydatid fluid subcutaneously or intraperitoneally.

C. L.

Mollow (W.). Ueber die Beeinflussung der biologischen Reaktionen nach Anstellen der Casonischen Reaktion bei der Echinokokkenkrankheit des Menschen. [**Biological Effects of Casoni's Reaction for Hydatid Infection.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1928. Apr. Vol. 32. No. 4. pp. 187–194. [18 refs.] [Intern. Clinic, Univ., Sofia.]

It was found that the Casoni reaction might be followed by an eosinophilia; while in two cases it apparently provoked a positive Weinberg reaction. The cases detailed number six.

C. L.

i. Stoll (Norman R.). **On Methods of counting Nematode Ova in Sheep Dung.**—*Parasitology.* 1930. Jan. Vol. 22. No. 1. pp. 116–136. With 1 plate & 1 text fig. [16 refs.]

ii. ——. **Studies with the Strongyloid Nematode,** *Haemonchus contortus.* **I. Acquired Resistance of Hosts under Natural Reinfection Conditions Out-of-Doors.**—*Amer. Jl. Hyg.* 1929. Sept. Vol. 10. No. 2. pp. 384–418. With 6 figs. [50 refs.] [Rockefeller Inst. for Med. Research, Princeton, New Jersey.]

i. Stoll has compared the collections of ova of *Haemonchus contortus* from sheep's dung by D.C.F. and by his dilution method. Regarding the former he points out that a failure to find ova predominantly in the preparation made after the first centrifuging in salt solution may be due to a drop of water remaining at the top of the tube after the precipitation of the watery faecal suspension and the pouring away of the supernatant fluid. This water dilutes the upper layer and prevents the eggs from rising into it. Stoll used 0·5 gm. of faeces and found that it produced at the bottom of the tube a mass of debris 2 cm. high and so compact that the complete upending of the tube was possible without disturbing it. Moreover, there were practically no eggs in the pour-off, while the first cover brought away 87·3 per cent. and the second 11 per cent. of all eggs recovered. D.C.F. collected only 90 per cent. of the eggs recovered by Stoll's own method. He reproduces figures of eggs in which the egg contents are expressed from the shells during D.C.F.

[Stoll has evidently not closely studied the description of D.C.F. which he quotes, for he has inadvertently altered it in essential particulars. He has omitted the use of a disintegrator in the salt solution and has not corked and upended the tube to mix its contents completely. Both are essential for certain success and their omission is enough to cause inaccuracy. Moreover, in transferring D.C.F. to sheep dung Stoll has used an amount which produces a deposit ten to twenty times as great as 1 cc. of human faeces gives. With so much material passing downwards at the same time as eggs are passing upwards during centrifuging, it would be surprising were an essential percentage of eggs not entangled and carried down. That D.C.F. imperfectly executed was not at its best in sheep dung should not discourage its use properly effected in the human faeces for which it was devised. That eggs should burst is, as already pointed out, contrary to physical laws and has never occurred in the many tens of thousands of eggs seen by the abstractor.]

ii. While Stoll used his own technique for counting heavy infections, he fell back on D.C.F. for all infections below 1,000 eggs per gram. Of two clean segregated lambs, one was deliberately infected with 45 haemonchus larvae grown from the eggs of one worm; and all later infections in both lambs were from the progeny of these larvae, for the two animals were set to graze on restricted areas of clean pasture which

could be infected only by themselves. Faecal egg output reached its peak about two months after initial infection, and then rapidly fell, so that 4 to 6 weeks later eggs were not always found, " indicating that the egg flow was spasmodic at so low a concentration as to prevent their regular demonstration *even** by D.C.F." Nor did massive feeding of larvae to one lamb increase the degree of infection. D.C.F. was found superior to Baermann's extraction method in the recovery from sheep's dung of larvae which had been fed to the animal, yet [not unexpectedly] only a small percentage of those administered were recovered from the dung. The general results are best explained by the acquisition of a marked immunity to the infection. About a year after the beginning of the experiment dogs got into the flock and killed both animals. The egg contents per gram of faeces removed from the rectum after death were 70 and 1, while the worms recovered from the stomach were 55 and 27 respectively. [While the worms varied as 2 to 1, the eggs varied as 70 to 1. There was, then, no correlation between these egg counts and these worm counts.]

C. L.

SPINDLER (L. A.). **The Relation of Moisture to the Distribution of Human Trichuris and Ascaris.**—*Amer. Jl. Hyg.* 1929. Sept. Vol. 10. No. 2. pp. 476–496. With 2 text figs. [37 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

Field studies were made in West Virginia and three areas were selected for special comment. In Darkey Town with shaded yards the percentage incidence of trichuris was 61 and of ascaris 56. In Pagetown the incidence of both infections was 85, and the ground round the houses exposed, dry and hard ; but under the houses it was shaded and damp, and there the children defaecate. In Pardee trichuris infection was 20 per cent. and ascaris 58, and the soil in the yards dry and hard ; the presence of possible under-house infection is unnoted. Live embryonated trichuris eggs were found seldom in soil from unshaded places, but frequently in that from damp shaded spots. Soil moisture is then held to be the principal factor in the development of trichuris eggs to maturity and literature is cited supporting this conclusion.

Experiments were made on faeces kept in a 5 per cent. formaldehyde solution in an ice box till used, the eggs being then recovered by centrifugal floatation in saturated salt solution and placed on coverslips to dry. From some dried slips eggs were washed into water and incubated at 22° C. and 30° C. as controls ; they developed satisfactorily. Other slips were placed in incubators at 22° C. and 30° C., and at 77 per cent. saturation and 100 per cent. saturation with moisture. At 22° C. and 77 moisture, all trichuris eggs were dead on 11th and 12th days, ascaris eggs being alive on the sixteenth day. At 22° C. in saturated air, 98 per cent. of trichuris eggs were dead on the 19th day, and again 96 on the 12th day, though 39 per cent. of ascaris eggs were embryonated the sixteenth day. At 77 saturation and 30° C. all trichuris eggs were dead on the 16th day ; ascaris flourished. It is concluded that the moisture requirements of trichuris eggs are higher than those of ascaris [a conclusion which seems to involve the assumption that the preliminary treatment affects both species equally.]

C. L.

* Italics not in original.

Avinée (E.) & Tiprez (J.). Sur la régularité des pontes de l'*Ascaris* et du trichocéphale dans les fèces. [**The Regularity of Egg-laying by Ascaris and Trichuris.**]—*C.R. Soc. Biol.* 1929. Vol. 102. No. 36. pp. 1030–1031. [2 refs.]

The authors used a technique, which they will subsequently describe and which, they state, produces a stable suspension of faeces. With it they examined 31 infected persons for ascaris and trichuris. There were no periods in which eggs were intermittently absent; there were variations in their number, but these were trifling. They conclude regarding these parasites that the fear that negative examinations may occur in parasitized men are groundless.

C. L.

Ranieri (Gustavo). Sindromi rare di parassitosi intestinale. II. Nota. Pseudo occlusione intestinale spastica da elmintiasi (ascaridi e ossiuridi). [**Rare Syndromes in Intestinal Parasitism. II. Enterospasm in Helminthiasis (Ascaris and Oxyuris).**]—*Riforma Med.* 1930. June 2. Vol. 46. No. 22. pp. 839–840. [Inst. of Clin. & Med. Path., Univ., Messina.]

A boy of 15 years sent to hospital for immediate operation for acute intestinal obstruction. Many of the symptoms of " acute abdomen " were present, but the facies was not typical, temperature was not subnormal, and the general condition was good. An enema was given and ova of *Ascaris lumbricoides, Oxyuris vermicularis* and *Trichuris trichiura* were seen in large numbers. Treatment with santonin, calomel and a purgative resulted in cure.

H. H. S.

Cort (W. W.), Otto (G. F.) & Spindler (L. A.). **Investigations on *Ascaris lumbricoides* and the Associated Intestinal Helminths of Man in Southwestern Virginia.**—*Amer. Jl. Hyg.* 1930. Jan. Vol. 11. No. 1. pp. 1–55. With 1 map, 1 graph & 9 text figs. [16 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

Some of the results of an investigation in southwest Virginia have been reported separately by Spindler and Otto. Others are here described. Of children 50 per cent. and of adults 30 per cent. were found infected and nearly all heavy infections were in children. The infection ran in families, and the surfaces of house yards of infected families were studded with pollution rich with ascaris eggs, because the youngest children did not use the privies which were always present. Where children were under control and made to use these, infection was at least exceptional. There was no evidence that the water supply contributed to carry infection, nor that " the general environmental conditions, amount of vegetation or the character of the soil influenced ascaris infestation except in those places where unshaded yards were covered with a layer of cinders." The trichuris condition has been noted in the other papers. Hookworm infection was present in 6·1 per cent. of cases, and few only were seriously affected. The diagnostic technique was Stoll's small drop, stools were " corrected " for consistency, and over 2,000 persons examined.

C. L.

Leitch (J. Neil). **Ascariasis.**—*Jl. Trop. Med. & Hyg.* 1929. Dec. 2. Vol. 32. No. 23. pp. 340–342.

A general survey of ascariasis is made from the clinical side. Some special points are as follows. On four occasions during the invasion stage Leitch has found larvae in the sputum. In addition to this, the signs of this stage are put as an atypical pneumonia, lobular rather than lobar, with blood-stained sputum and a temperature lower than is common with a bacterial infection. Rigors and septicaemia occurring later are attributed to secondary bacterial invasion. Death may follow cerebral, obstructive, or inflammatory complications. For treatment is advised santonin or a mixture of carbon tetrachloride and oil of chenopodium. Under prevention it is suggested that " ascaris embryos probably vie with their hookworm cousins in rising through remarkable depths of soil from buried faeces, while, unlike these, they can ' bide their time ' in their thick eggshell."

C. L.

Moretti (Giulio). Alcune osservazioni sulla diffusione quantità e persistenza nell' intestino delle uova di " Ascaris lumbricoides Linn." commiste a feci. [**Diffusion, Quantity and Persistence of Ascaris Ova.**]—*Riforma Med.* 1928. Sept. 10. Vol. 14. No. 37. pp. 1194, 1197, 1198. [26 refs.] [Bergamo Hosp., Bergamo.]

Moretti holds that for ascaris the simple smear gives as certain a diagnosis as the concentrative methods which he has tested ; and in most cases eggs were found in the first smear if they were found at all. In 111 children examined, ascaris was found in one only, but from 3 to 10 years of age the incidence was uniform at all ages. There was some evidence of a familial incidence. Egg counts checked against the mean weight of faecal output in one child put the daily egg output of the female ascaris as 107,000.

C. L.

Otto (G. F.). **A Study of the Moisture Requirements of the Eggs of the Horse, the Dog, Human and Pig Ascarids.**—*Amer. Jl. Hyg.* 1929. Sept. Vol. 10. No. 2. pp. 497–520. With 2 graphs. [25 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

Faeces were placed on the surface of four " soils "—clay, sand, loam, and a mixture of cinders and loam. [Whether " soil " means the humus overlying such subsoils, as it would in England, or the subsoil itself, as it often seems to do in America, is uncertain.] The elected sites lay either in sun or shade. They were exposed to the ravages of and, in the sun especially, were rapidly destroyed by dung-eating insects. Samples from a polluted area were examined for ova by the Caldwell's method, the eggs recovered being classed as : alive and embryonated, alive and non-embryonated, dead. Tables show the percentages of each class to the total count of the specimen, without correlation to the number originally present. Samples, it is pointed out, may be " unrepresentative," since a small lump of faeces may be examined in one and earth without faeces in another. Thus 3 samples from an unshaded site on loam, taken at intervals over a month, averaged 31 per cent. of live embryonated eggs ; the next sample showed none alive, the next 29 per cent. alive. The mortality percentage as thus defined was bigger

and set in earlier in sun than shade. Eggs taken from the last portion of the uterus of the worm were cultured in incubators placed on sand, either dry or set in water and with an overlying atmosphere of known but varied saturation, and on glass slides or covers in the same conditions. Those in a heavily impregnated atmosphere did far better than others. It was found that the degree of saturation in the atmosphere necessary to produce development to embryonization was 80, that as the temperature rose from 22° C. to 30° C. the moisture requirement of the egg increased, and that the relative soil moisture did not affect the suitability of these soils for culturing ascaris eggs. [In cultures in a saturated atmosphere condensation as patent water is probably invariable on any surface. In these experiments the eggs were all on the surface.]

C. L.

Spindler (L. A.). **On the Use of a Method for the Isolation of Ascaris Eggs from Soil.**—*Amer. Jl. Hyg.* 1929. July. Vol. 10. No. 1. pp. 157–164. [3 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.]

The procedure, already mentioned (this *Bulletin*, Vol. 26, p. 985), may now be given in detail. By sweeping or light scraping over a wide area there is collected at least a pint of soil. After powdering and mixing, a 5 gm. to 10 gm. sample is added to 10 cc. of a 30 per cent. antiformin solution with frequent stirring. The antiformin must act on every particle of soil ; otherwise, it is stated, many eggs will remain adhering to the soil particles and will not be recovered in the subsequent centrifugal floatation(at 1,000 revolutions a minute for one or two minutes) in sodium bichromate solution of 1·35 s.g. Striking results of soil infection are noted when there was no evidence that faeces were being deposited, and it is believed that they will prove of quantitative value ; but it seems admitted that not all eggs are recovered. Perhaps another observation partly explains this. It is said, " The number of embryonated eggs recovered in isolations was surprisingly small. Theoretically as the soil of an area is constantly polluted and the eggs go on developing, there should be a piling up of enormous numbers of embryonated eggs." [A fair comment seems to be that since embryonated hookworm eggs do not float with the certainty with which do those in the earlier stages, it needs investigation as to whether embryonated ascaris eggs do not suffer from the same disability. If so, the proportion of embryonated eggs recovered by floatation will prove no measure of the proportion present in the earth.]

C. L.

Khaw (O. K.). Untersuchungen ueber Hautreaktionen bei Impfung mit Ascaristrockensubstanz. [**Skin Reactions in Inoculation with Dried Ascarides.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Jan. Vol. 33. No. 1. pp. 46–50. [6 refs.]

Experiments were made on 99 school children and 37 Buddhist monks. The conclusion falls in with that of others, namely, that the skin reaction is not of value in the detection of ascaris infection, since it may be positive when no eggs are discovered and negative when they are. In Amoy trichuris eggs were found in half the cases, ascaris occupied the second place, hookworm eggs were seldom detected and clinical

ankylostomiasis was not met with. Diagnosis was by three smears of unstated size and three covers obtained by FÜLLEBORN's gravity floatation method.

C. L.

JADASSOHN (Werner). Allergiestudien bei der Ascaridenidiosynkrasie. [**Study of Allergy in Idiosyncrasy to Ascaris Infestation.**]—*Arch. f. Dermat. u. Syph.* 1928. Nov. 9. Vol. 156. No. 3. pp. 690–745. With 55 text figs. [68 refs.] [Dermat. Clinic, Zurich.]

This very extensive and important study of the reaction of the skin to extracts of Ascaris not only confirms and reviews many of the previous findings on this subject, but gives the results of many experiments performed by the author and some new and important conclusions. He is concerned with the immediate type of reaction and he points out that it is well known that asthma, hay-fever-like symptoms and urticaria are provoked by contact with ascaris antigens. These symptoms can be provoked by minute quantities and are associated not only with ascaris infections, but with the presence of ascaris in the environment; e.g., a laboratory worker or a slaughter-house worker may become sensitized without ever having harboured the helminth. He finds that an immediate reaction follows the injection of an ascaris antigen in 80 per cent. of persons between 2 and 40 years of age; but that children under one year old never react, and the effect is less frequent in old persons. A definite relationship between ascaris infection and the cutaneous reaction could not always be demonstrated, however, while a previous infection does not exclude a negative reaction.

The antigen was thermostabile, but becomes deprived of its effect after boiling with 10 per cent. hydrochloric acid. It is not affected by 0·5 per cent. phenol, lengthy autolysis, peptic or tryptic digestion. It is dialysable, i.e., it is *not* albuminoid.

The author repeated the work of PRAUSNITZ and KÜSTNER and finds that their antibody keeps its activity for a week in an ice box, is not impaired by 0·5 per cent. phenol or 5·0 per cent. chloroform (if the latter is removed *in vacuo*), is fairly resistant to peptic and tryptic digestion, is not found in the dialysate, but has its activity lowered by heating to 56° for one hour and destroyed after six hours. In serum with a high sensitivity to ascaris there is no precipitin. He found also that the Prausnitz-Küstner experiment was successful with citrated blood instead of serum and that the antibody sensitizes the skin against antigen from either horse or human ascarids.

In vitro experiments showed that the power of the antigen could be destroyed by mixture with the antibody and *vice versa*; i.e., the antibody and the antigen appear to neutralize each other, and the mixture becomes inoperative. This occurs only after the lapse of an hour at room temperature, and the neutralization is not affected by warming to 56° for six hours or by acidifying the mixture. He considers that this antigen-antibody reaction is never a complete one, but that, in addition to the neutralized substance in the mixture, both original substances are present in solution. This neutralization phenomenon can also be demonstrated on skins which are primarily susceptible or are rendered so by injection of the Prausnitz-Küstner antibody, provided that the test areas are neither too large nor too small.

[There are two main types of cutaneous tests: the first depends on hypersensitiveness to specific materials (e.g., hay fever), while the

second depends on the injury caused by a definite toxin in the absence of its antibody. In ascaris infection the reaction is of the first type and there is an immediate reaction almost at once after injection of the antigen as well as a delayed reaction some hours later. It is with the first of these reactions that the present paper is concerned. The immediate reaction may be demonstrated after scarification or by intradermal injection of the antigen. PRAUSNITZ and KÜSTNER (*Zent. f. Bakt.*, 1921, Vol. 86, pp. 160–169) demonstrated that the intradermal injection of serum taken from an ascaris sensitive subject could cause a local temporary passive sensitization in a non-sensitive patient.]

Thomas W. M. Cameron.

HEGGLIN (Otto). Zur Verbreitung und klinischen Bedeutung der Askaridenallergie. [**Distribution and Clinical Significance of Allergy in Ascariasis.**]—*Schweiz. Med. Woch.* 1929. Jan. 5. No. 1. pp. 11–14. With 2 text figs. [10 refs.] [Dermat. Clinic, Univ., Zurich.]

Hegglin, as the result of over 400 experiments, confirms the conclusions of others, that ascaris infection and skin sensitiveness to ascaris toxin do not run parallel.

C. L.

LAMSON (Paul D.), WARD (Charlotte B.) & BROWN (Harold W.). **An Effective Ascaricide—Hexylresorcinol.**—*Proc. Soc. Experim. Biol. & Med.* 1930. June. Vol. 27. No. 9. pp. 1017–1020. [5 refs.] [Med. School, Vanderbilt Univ., Nashville, Tenn.]

Hexylresorcinol is the most promising drug which several years' search in the authors' laboratory for a non-toxic ascaricide has so far revealed. It is a white waxy crystalline substance, melting at 59°–61° C., slightly soluble in water or mineral oil, readily soluble in alcohol, glycerine and vegetable oils. "It has been shown by Veader Leonard to have an extraordinarily high bactericidal action and to be the least toxic of a large series of substituted resorcinols which he has studied. It has been given as the pure crystals in gelatin capsules by mouth in doses varying from 0·1 to 1·0 gm. 3 times a day for as much as 10 weeks without deleterious effect, and to many hundreds of patients in olive oil under the name of caprokol (N.N.R.) as a urinary antiseptic." It has proved, it is reported, of marked anthelmintic value against ascaris of dog, pig and man. The evidence is to be given later. It produces burning in mouth and stomach, and in dogs reddening of the gastric mucosa, submucous haemorrhage and even epithelial necrosis, the irritant action being increased by alcohol.

C. L.

VILLIGER (E.). Beitrag zu den chirurgischen Komplikationen bei Askariden. (Ileus bei einem mit Askariden vollgepfropften Meckel'schen Divertikel.) [**Surgical Complications in Ascariasis.**]—*Schweiz. Med. Woch.* 1929. Sept. 7. No. 36. pp. 909–910. With 1 text fig. [Canton Hosp., Aarau.]

In the abdomen of a child of ten, opened for appendicitis, there was found 50 cm. above the caecum a Meckel's diverticulum with paper-thin walls, through which, as white streaks and prominences, could be seen ascarids. The diverticulum was removed and contained 64 ascaris which had caused diverticulitis.

C. L.

Sinicco (Silvestro). Ascaridiosi intestinale in bambino di undici mesi—Infestazione dei dotti pancreatici e delle vie biliari extra e intraepatiche—Ascessi multipli del fegato—Cirrosi del fegato e del pancreas. [**Complications of Ascariasis in Child of 11 Months.**]—*Arch. Ital. Sci. Med. Colon.* 1927. Dec. Vol. 8. No. 12. pp. 701–711. With 5 figs. on 3 plates. [21 refs.]

The child was passing ascarids by mouth and anus. The mother feared it would be suffocated. After an anthelmintic this emission continued. Death was from broncho-pneumonia. The title shows the lesions found. There were 300 ascarids in the duodenum, and numbers in the bile passages and in cavities in the liver where some lay just under the peritoneum.

C. L.

O'Brien (Henry R.). **Ascaris in the Appendix.**—*China Med. Jl.* 1929. Nov. Vol. 43. No. 11. p. 1144. [McCormick Hosp., Chiengmai, Siam.]

Two or 3 weeks after intermittent pain in the right lower abdominal quadrant, a girl of 18, who had hookworm and ascaris eggs in the faeces, was given 0·67 cc. of oil of chenopodium and operated on next day. An ascaris filled the appendix, half its length lying in the caecum. It could not be " milked " back into the caecum, but on opening the tip of the appendix it crawled out. It is believed that it took refuge in the appendix only after the taking of chenopodium, on the ground that a prolonged residence in the appendix should have set up more peritonitis than was found at operation.

C. L.

Henriques (J. F.). **Ascariasis simulating Abdominal Tumours.**—*Indian Med. Gaz.* 1929. Oct. Vol. 64. No. 10. p. 571.

There were 4 or 5 masses in the abdomen of a child of 5. The condition was said to have been present for 2 months. Salol given as a *placebo* in the belief that the tumours were malignant removed the tumours and expelled 25 worms. Santonin expelled a few more.

C. L.

Stekhoven (J. H. Schuurmans), Jr. **Researches on Nemas and their Larvae, III.** *Strongyloides stercoralis* **Bavay.**—*Ztschr. f. Parasitenk.* Berlin. 1928. Aug. 10. Vol. 1. No. 2. pp. 231–261. With 37 text figs. [45 refs.] [Zool. Lab., Reich Univ., Utrecht.]

This paper contains a critical summary of certain literature on *S. stercoralis* together with the author's observations. His attention was called to the subject by a slide containing scraps of the mucosa removed by a duodenal tube. The cells of the crypts " enclosed " larvated eggs ; their recovery by duodenal tube, it is noted, has already been recorded. Filariform larvae and the free living adults are closely described. The first he believes has three lips, 4 submedian papillae, and the openings of an amphid at each side. As regards the forces producing adult forms, he holds that conditions are complicated and further cytological studies needed. Regarding autoinfection he cites a case of passage of old, hard faecal pellets after chenopodium and a purgative. The stool contained just-hatched and still-coiled larvae, rhabditiform larvae and filariform larvae. The host had been out of the tropics for " a long

period." The paper by Fülleborn (this *Bulletin*, Vol. 24, p 528) with its evidence for autoinfection is not mentioned. As regards persistence in cultures, " according to these experiments the longevity does not exceed 3 to 4 weeks under favourable conditions of humidity and temperature." [The cultures were not, however, trapped and elsewhere Stekhoven notes how marked is the disposition of filariform larvae to form collections on prominent points of the culture ; that is to say, they show an instinct which will carry them out of cultures in proportion as they are lively and so presumably long lived. Those remaining in cultures are therefore presumably the weaklings, those least likely to survive.]

C. L.

Ophüls (W.). **A Fatal Case of Strongyloidosis in Man, with Autopsy. The Life Cycle of** *Strongyloides intestinalis* **in Man.**—*Arch. Pathology.* 1929. July. Vol. 8. No. 1. pp. 1–8. [19 refs.] [Med. School, Stanford Univ., San Francisco.]

An acute streptococcal stomatitis, vomiting and diarrhoea with circumanal excoriation, weakness, collapse, and death occurred in a railway engineer of 36 who had lived all his life in Texas except the last six months in California. Autopsy within a few hours of death disclosed a gastritis, the mucous membrane of the pyloric region showing " mother worms," ova and rhabditiform embryos. The mucosa of the colon showed a considerable number of filariform larvae, the submucosa and muscular coat a few, while some were also found in the swollen lower mesenteric lymph nodes. Presumably, then, there was occurring the development within the body of infective larvae and reinfection by larvae which never left the anus, an extracorporeal stage being completely cut out.

C. L.

Stähelin (Adolf). Studien ueber den Mechanismus der Trichinellen-infektion. I. Mitteilung. [**Mechanism of Trichinella Infection.**] —*Cent. f. Bakt.* I. Abt. Orig. 1927. Dec. 20. Vol. 105. No. 1/3. pp. 114–133. [10 refs.] [Hyg. Inst., Univ., Basel.]

The mechanism of infection is viewed as occurring in two stages : entry into striped muscle and development therein. The young larvae do not enter isolated fragments of muscle which have been transplanted into peritoneum, subcutaneous tissue, or other muscle ; but they do enter and develop in paralysed muscle, and, if expressed from muscle while quite young and injected into the carotid artery or into striped muscle, they will develop and encyst in muscle ; but if muscle containing young larvae is transplanted, they do not migrate out of it. Larvae encysted in a piece of muscle finally die if that is transplanted into other muscle, but if the animal is of the same species (guineapig to guineapig) they remain alive and infective for more than forty days, whereas if it is of another species (rabbit to guineapig) all are incapable of infection in 15 days ; if the transplanted muscle contains young instead of encysted larvae their death is very rapid even when the animals are of the same species. Infection is not produced by feeding either with intestinal trichinella or with unencysted larvae which have reached muscle.

C. L.

Doerr (R.) & Schmidt (G. W.). Studien ueber den Mechanismus der Trichinelleninfektion. VI. Die Besiedelungsdichte der quergestreiften Muskeln und ihre Abhängigkeit von der Art der Einschaltung der Trichinenembryonen in den Blutkreislauf. [**Studies of Trichinella Infection. VI. The Density of Deposition in Striated Muscle and its Relation to the Mode of Entrance of the Embryos into the Circulation.**]—*Zent. f. Bakt.* I. Abt. Orig. 1929. July 30. Vol. 113. No. 3/4. pp. 271–277. [Hyg. Inst., Univ., Basel.]

If female embryo-containing trichinellae are injected into the venous circulation the development of measles is greater in the masseters than in the diaphragm or muscles of the extremities, the degree of infection in these being in decreasing order as follows : diaphragm, anterior limb, posterior limb. If a common carotid be tied the amount of infection in the muscles supplied by it is lessened. If injection be made into an artery there is a generalized infection, but the muscles supplied by that artery are those most affected.

C. L.

Weindrach (G.). Das Blutbild und die Eosinophilie bei Trichinose. [**The Blood-Picture and Eosinophilia in Trichiniasis.**]—*Folia Haematologica.* 1929. July. Vol. 38. No. 3/4. pp. 380–384. [7 refs.] [Soviet Hosp., Odessa, & Bact. Inst., Viatka.]

Weindrach reports 3 cases of trichinosis which were followed up for 3 years and 7 months. There was a primary leucocytosis with an eosinophilia in the neighbourhood of 50 per cent. The former was not persistent, the latter did not reach normal in two of the three cases within the period of observation. Red corpuscles neared or exceeded 6,000,000 about the end of the first month, and then fell to or below normal.

C. L.

Bachman (George W.). **A Precipitin Test in Experimental Trichiniasis. Second Report.**—*Jl. Preventive Med.* 1929. Nov. Vol. 3. No. 6. pp. 465–469. [2 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.] [Summary appears also in *Bulletin of Hygiene.*]

Continuing his work with Trichinella [see this *Bulletin*, Vol. 25, p. 470], Bachman prepared an antigen, as before from larvae separated from infected meat by artificial digestion, dried and pulverized, but suspended in Coca's solution (NaCl, 0·7 per cent. ; $NaHCO_3$, 0·05 per cent. ; and phenol, 0·4 per cent.) for 24 hours or longer at room temperature. He finds that precipitin antibodies can be detected 5 to 20 days after infection, i.e., during the period of ingression, when the adults are present in the small intestine and before larvae have entered the blood stream. His previous antigen, extracted with 0·01/N hydrochloric acid in normal saline, did not detect the parasites before the 20th day after infection.

T. W. M. Cameron.

Bachman (George W.) & Menendez (Paris E.). **Complement Fixation in Experimental Trichiniasis.**—*Jl. Preventive Med.* 1929. Nov. Vol. 3. No. 6. pp. 471–473. [5 refs.] [School of Hyg. & Public Health, Johns Hopkins Univ., Baltimore.] [Summary appears also in *Bulletin of Hygiene.*]

Bachman and Menendez have used as antigen dried larvae extracted with Coca's solution. The sera of eight rabbits were tested and the titres rose on the 3rd day after infection, dropped from the 15th to the 20th day, and rose rapidly again to the 35th day. Owing, however, to the great variability in titre and the non-specific reaction of the serum of the rabbits, the authors doubt if the method is of any practical value before the 25th day after infection.

T. W. M. Cameron.

Caldwell (Fred C.) & Caldwell (Elfreda L.). **A Study of the Anthelmintic Efficiency of Higuerolatex in the Treatment of Trichuriasis, with Comment as to its Effectiveness against Ascaris Infestation.**—*Amer. Jl. Trop. Med.* 1929. Nov. Vol. 9. No. 6. pp. 471–482. [14 refs.] [Field Research Lab., Internat. Health Division Rockefeller Foundation, Andalusia, Alabama.]

A survey of the literature shows that trichuris is not to be taken as a harmless commensal and that it is not readily removed. In this investigation a preliminary study of 9 cases suggested that higuerolatex, held to be the latex of *Ficus laurifolia*, was an efficient vermifuge for trichuris, one patient indeed passing a ball of 1,956 living worms, 900 males and 1,056 females. Accordingly a series of 117 trichuris infections was treated with 60 cc. of the latex mixed with 2 ounces of milk, and the same number with 1·5 cc. of oil of chenopodium [of unstated ascaridole content] in two halves given in hard gelatin capsules. The fact of infection was established by "the salt flotation method" [of which there are a number of varying accuracy], and the amount of infection by egg counts by the authors' antiformin method on stools sent to a central laboratory and there kept on ice. Worm counts are held exceedingly laborious, often inaccurate and almost impossible on a large scale. After latex the percentage of egg reduction was 85·4 and the cures, presumably to "the salt flotation method," 53·8, the corresponding figures after oil of chenopodium being 17·0 and 1·7. As regards ascaris the two treatments proved about equally effective, allowing for the degree of accuracy of the diagnostic methods used.

C. L.

Robbins (Benjamin H.). **A Proteolytic Enzyme in Ficin, the Anthelmintic Principle of Leche de Higueron.**—Reprinted from *Jl. Biol. Chem.* 1930. June. Vol. 87. No. 2. pp. 251–257. With 1 text fig. [7 refs.] [Med. School, Vanderbilt Univ., Nashville.]

Robbins obtained from Caldwell a quantity of Leche de Higueron. Whether it is derived from *Ficus laurifolia* or *F. glabrata* he considers uncertain. The crude sap is a yellow-white syrup containing 25 per cent. by weight of protein. He set out to determine its active constituent. Suspended matter so far as it precipitates on centrifuging

is inactive. By treating the fluid portion with 3 parts of acetone a waxy mass is formed ; on dissolving this in water, reprecipitating, washing with acetone, and drying in a vacuum with calcium chloride, a light yellowish powder is obtained—about 12 gm. from 100 cc. of sap. It is named ficin and gives the protein reactions. The ascaricidal properties described are most remarkable. H. W. Brown in a personal communication informs Robbins that ascarids remain without evident change in Ringer's solution for a fortnight ; but fresh living ascarids from the pig placed in a 0·1 or 0·2 per cent. solution of ficin in Ringer's fluid at body temperature become within an hour flaccid and wrinkled and generally have slight blister-like lesions anteriorly. Half an hour later these have become ulcers, 3 by 1 mm., all over the body and almost perforating the body wall. Within two hours perforation has occurred and the viscera protrude through the openings. Nevertheless the worms still move. They actually become dissolved alive. Ficin heated to 75° C. is rendered permanently inactive ; with a pH between 4 and 9 it is active ; with one between 2 and 3 it is not, and neutralization does not restore activity ; it readily hydrolyses coagulated egg albumen and casein ; it forms leucin and tyrosin. Ficin then acts as a proteolytic ferment of the trypsin type having a specific action on ascaris. " Ficin was found to digest hookworm, but less readily than ascaris and had no effect on the spiny headed worm [echinorrhynchus?] which is found living with ascaris in the pig's intestine." It is pointed out that the large 60 cc. dose used by the Caldwells [which would furnish 60 litres of an active ascaris-dissolving fluid] is presumably necessary because of the destruction of ficin in the stomach. [Doubtless its administration in capsules dissolving in the intestine only will be undertaken.]

C. L.

Pirot & Barrat. *Hepaticola hepatica*, Hall 1916, parasite du rat à Saïgon. Existe-t-il sur les rats de bord en Extrême-Orient ? [**Is** *H. hepatica* **found in Ship Rats in the Far East ?**]—*Arch. Méd. et Pharm. Nav.* 1929. Apr.–May–June. Vol. 119. No. 2. pp. 277–283. [5 refs.]

An interrupted research showed frequently the eggs of *Hepaticola hepatica* in the livers of rats (*Mus decumanus*) in Saigon. The eggs from ground-up liver developed at 28° C. to 31° C. in neutralized animal charcoal to the embryo stage.

C. L.

Zawadowsky (M. M.) & Schalimov (L. G.). Die Eier von *Oxyuris vermicularis* und ihre Entwicklungsbedingungen, sowie ueber die Bedingungen, unter denen eine Autoinfektion bei Oxyuriasis unmöglich ist. [**The**] **Developmental Needs of Ova of** *Oxyuris vermicularis* **and the Restrictions which make Autoinfection in Oxyuriasis Impossible.**]—*Ztschr. f. Parasitenk.* 1929. June 17. Vol. 2. No. 1. pp. 12–43. With 17 text figs. [24 refs.] [Inst. General Biol., IInd State Univ., & Lab. Exper. Biol., Zoological Gardens, Moscow.]

It is concluded from the experiments made that the eggs of threadworms will develop further after leaving the body only if they have already reached the tadpole stage. If they have done so they will

develop in normal saline, in water, in saturated copper sulphate solution, in formalin and other media. Female worms found in the appendix are unfertile. Development occurs between 20° and 40° C. ; oxygen must be present, but it is held that in the rectum the worms might obtain this by sucking blood. The shell is held to consist of four membranes. The innermost is soluble in alcohol, ether, chloroform and acetic acid, and is held to be clearly lipoid and a protection against chemical substances, whilst the other three form a mechanical defence ; the means by which they are severally identified are not easy to follow. The italicized conclusion is that since threadworm eggs cannot develop beyond the tadpole stage without oxygen and since this is absent in the gut autoinfection is impossible. [Apparently, then, the author's suggestion that the worms possibly obtain oxygen by blood-sucking is not seriously entertained.]

C. L.

Cameron (T. W. M.). **The Species of *Enterobius* Leach, in Primates.**—*Jl. Helminthology.* 1929. July. Vol. 7. No. 3. pp. 161–182. With 28 text figs. [9 refs.]

Cameron describes 12 species of *Enterobius* from Primates to which order the genus is limited. He points out that the life history of the members of the genus tends to make them parasites of the individual.

C. L.

Oleinikow (S. V.). Sur le diagnostic et l'épidémiologie dans l'enterobiose. [**Diagnosis and Epidemiology of Enterobiosis.**]—*Russian Jl. Trop. Med.* 1929. Vol. 7. No. 6. pp. 393–401. [In Russian. French summary.]

A table in the paper shows that in 3,042 examinations worms were found in the following percentages: *E. vermicularis* 89, ascaris 5·5, taenia 3, trichuris 0·8, *H. nana* 0·7, *Dicrocoelium lanceatum* 0·3, *Diphyllobothrium latum* 0·03. It appears from the summary that diagnosis depended entirely on scraping the perianal area with a spatula and the careful cleaning of the spatula on the edge of a slide. Sometimes " the spatula was centrifuged " in water. Apparently an anthelmintic added 8 per cent. to the diagnosis as above advocated. The place concerned is Ufa. Enterobius infection is held to take place often by the aspiration of dust.

C. L.

Lubieniecki (H.). Zur Frage der individuellen Verschiedenheiten in der Entstehung und im Verlaufe der Oxyuriasis. [**Individual Variations in the Origin and Cause of Oxyuriasis.**]—*Wien. Klin. Woch.* 1929. Nov. 28. Vol. 42. No. 48. pp. 1526–1531. [14 refs.]

The literature is surveyed and it is concluded that oxyuris can reinfect without oral reinfection, blood is its probable food, possibility of any infection hangs on the individual person and even on the individual moment, and depends presumably on the amount of intestinal fermentation and on the state of the blood. Further investigation is suggested.

C. L.

CHIARI (Hermann). Ueber das Vorkommen von Oxyuren im menschlichen Eileiter. [**Occurrence of Oxyuris in Human Oviduct.**]—*Virchows Arch. f. Path. Anat. u. Physiol.* 1928. Oct. 12. Vol. 269. No. 3. pp. 730–738. [24 refs.]

In the distended Fallopian tube of a woman of 20 removed for pelvic peritonitis was found a mature female threadworm. The anatomical condition of the organ is described.

C. L.

MAPLESTONE (P. A.). **A Case of Human Infection with a Gnathostome in India.**—*Indian Med. Gaz.* 1929. Nov. Vol. 64. No. 11. pp. 610–614. With 2 text figs. [21 refs.] [School of Trop. Med. & Hyg., Calcutta.]

Maplestone reviews 10 previous reports on gnathostome infection in man, and describes a new case in a Mahommedan male of 26, who had never left Bengal. A swelling appeared between the right thumb and forefinger without pain or tenderness. It spread after 3 or 4 days to the dorsum and palm of the hand, and to the middle finger, at whose tip, after about 2 days more, a whitish point showed. On being pricked the worm escaped and all inflammatory signs, which had included enlargement of the epitrochlear gland, rapidly disappeared. The worm was a gnathostome 3·56 mm. long, the head had 4 rows of spines 12 to 16μ long, and 9 to 14μ broad. The body ridges over the whole body carried spines, so that it is held unlikely that it was an immature *G. spinigerum*. The zoological position, geographical distribution and biology are discussed. Human gnathostomiasis has now been reported from India, in part of which at least animal infections are not uncommon.

C. L.

SPREHN (C.). *Diplogaster lirata* (Schneider, 1866) Oerley, 1885, ein freilebender Nematode im Urin eines Mannes. [**A Freeliving Nematode in Human Urine.**]—*Cent. f. Bakt.* I. Abt. Orig. 1928. Aug. 21. Vol. 108. No. 5–6. pp. 310–313. With 2 text figs. [14 refs.] [Vet. Inst., Univ., Leipzig.]

The nematodes were found in preparations sent to the Zoological Museum, Berlin University, by Professor ROSIN of Berlin. The man from whom they came had urethritis, and the worms are accepted as having been passed in the urine. The literature concerning free living nematodes in the urine is reviewed, and the specimens now reported described, figured and discussed.

C. L.

i. BORREL (A.). Filaire et adéno-carcinome. [**Filaria and Adenocarcinoma.**]—*C. R. Soc. Biol.* 1928. Vol. 99. pp. 1862–1865.

ii. DOBROVOLSKAIA-ZAVADSKAIA (N.) & KOBOZIEFF (N.). Sur le rôle de la filaire dans les cancers de la souris. [**The Rôle of Filaria in Mouse Cancer.**]—*C. R. Soc. Biol.* 1929. Oct. 25. Vol. 102. No. 27. pp. 307–309. [2 refs.]

i. Borrel describes a technique and results which may bear on human filariasis though they were designed to investigate any possible connexion between filaria and mammary cancer in mice; they involved the staining and clearing of the whole skin in the tanner's sense. The shaved body is pinned out on cork covered with white paper, and

through a median incision the whole of the rest of the body is dissected from the " skin " and removed. On the cork are left the skin and subcutaneous tissues, including the four mammae. The cork and its burden are placed in 10 per cent. formol for 12 hours, strong alcohol 12 to 24 hours, and toluidine blue (10 per cent.) for 6 to 12 hours. The stained sheet of tissue is detached from the cork, lightly differentiated in 1 per cent. acetic acid, dehydrated in absolute alcohol which produces adequate decolorization, and cleared in xylol. Moreover, by skill and practice it has been possible to split the tissue and produce quite thin preparations. Examination of these membranes has disclosed filariae in 80 per cent. of cancerous mice and 20 per cent. of non-cancerous ones.

The other reactions are of yet greater interest in tropical pathology. The " skin " shows deeply stained lines 0·5 cm. to 2 cm. long, produced by collections of lymphocytes which are held to be haunts of filariae as characteristic as the form of a hare, and to show clearly the length of time during which a parasite has remained stationary. In one such " form " a male and female parasite were present, and another skin which had three parasites showed 10 " forms." Yet again chiefly, but not exclusively in male mice, the " skin " shows cysts, and in one Borrel has already reported the presence of a male and female filaria. [Clearly these observations have significant bearings on the tissue reactions of man to loa and onchocerca.]

ii. The authors examined by Borrel's method 40 mice, 38 of them having mammary tumours, and found filariae in 5 cases only—one leukaemic lymphadenoma, one sarcoma, and three adeno-carcinomata. Of their mice, then, 87 per cent. developed mammary tumours without filariae being discovered.

C. L.

COUTELEN (F.). Nature et rôle biologique du corps central interne des microfilaires. [**Nature and Biological Function of the Central Body of Microfilariae.**]—*Ann. Parasit. Humaine et Comparée.* 1929. Sept. 1. Vol. 7. No. 5. pp. 410–418. [29 refs.] [Parasit. Lab., Faculty of Med., Paris.]

Intra-vitam staining with neutral red has convinced Coutelen that the central body of microfilariae consists of an elongated vacuole with walls which become stained. The contents of the vacuole are granular. These granules, which may be few or many and in appearance are typical of vitelline vacuoles or particles of secretion, do not stain. He considers that they are vitelline in function and origin and constitute a nutritive reserve which remains over from the egg, and is of a protein nature with no evidence of glycogen.

C. L.

DE ROOK (H.). Filariasis onder de Papoea's aan den Boven-Digoel. [**Filariasis in Dutch New Guinea.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1930. Aug. 1. Vol. 70. No. 8. pp. 739–745. With 2 plates. [3 refs.]

De Rook found infection with *Mf. bancrofti* to occur fairly commonly in this district (Dutch New Guinea). Of 216 men examined in daytime 11 per cent. were found to be carriers, of 32 men examined at night 25 per cent. *Mf. malayi* was only met with in carriers imported from elsewhere. Periodicity in *Mf. bancrofti* was found to be typically

nocturnal, the numbers found by night compared with those found by day varying between 102 to 1 and 434 to 1, while with *Mf. malayi* they were 22 to 1. The latter was not so typically nocturnal.

Hydrocele, fibrosis testis, elephantiasis and enlargement of the inguinal glands were common.

About the transmitter nothing is known so far. The imported *Culex fatigans* cannot be incriminated; *Aedes variegatus*, suspected by BUXTON, is not found.

W. J. Bais.

VAN SLEE (W.). Onderzoek naar het voorkomen van filaria te Mamoedjoe. [**Filariasis in Mamoedjoe.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1930. May 1. Vol. 70. No. 5. pp. 444–450. With 1 plate.

In the district of Mamoedjoe (west coast of Celebes) out of 1,024 natives 24·7 per cent. were found to be infected with filaria, for the greatest part *Mf. malayi*, in exceptional cases *Mf. bancrofti*. The periodicity of *Mf. malayi* is exclusively nocturnal (15·1 microfilariae at night against 1 in daytime). As regards the clinical symptoms the author states that *F. malayi* can cause the same manifestations as *F. bancrofti*. No chyluria was seen.

W. J. Bais.

KNAP (C. Reeling). Filariasis op Kabaena. [**Filariasis on Kabaena Island, Dutch East Indies.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1930. Apr. 1. Vol. 70. No. 4. pp. 305–311. With 1 map in text.

Kabaena is an island of mountainous character in the D.E.I. archipelago, south of Celebes. The author spent 9 days on the island and took the opportunity to collect data concerning the spread of filariasis. In various villages 540 specimens of blood were taken in daytime and 96 at night, of which respectively 37 and 28 were found to contain *Microfilaria bancrofti*. As clinical manifestations of the infection several cases of lymph scrotum and of hydrocele were noted, no chyluria, no undoubted elephantiasis. No search for the vector was made.

W. J. Bais.

i. O'CONNOR (F. W.). **An Experiment in the Treatment of Filarial Lymphangitis by Subcutaneous Injections.**—*Porto Rico Jl. of Pub. Health & Trop. Med.* 1929. Sept. Vol. 5. No. 1. pp. 11–15. [2 refs.] [Med. Dept., Columbia Univ., New York, & School of Trop. Med., San Juan, Porto Rico.]

ii. ——, GOLDEN (Ross) & AUCHINCLOSS (Hugh). **The Roentgen Demonstration of Calcified** *Filaria bancrofti* **in Human Tissues.**—Reprinted from *Amer. Jl. Roentgenology & Radium Therapy.* 1930. May. Vol. 23. No. 5. pp. 494–502. With 13 text figs. [11 refs.] [College of Physicians & Surgeons, Columbia Univ. & Presbyterian Hosp., New York.]

i. Lymphangitic patients often have a local spot of itching or excessive pain coming on before or during a lymphangitic attack. Since these symptoms may indicate the presence of a worm the sites were

injected with sulpharsphenamine 0·2 gm. dissolved in 2 cc. of a sterile 1 per cent. solution of novocaine. The persons chosen for treatment were suffering from lymphangitic attacks monthly or oftener, could clearly indicate a spot of the nature described, and that spot lay on the distal part of a limb, a fact which eliminated confusion from secondary inflammation of a lymph gland. The injections were painless or nearly so, there was no reaction local or general. Of the 20 cases which had been treated 5½ to 6 months earlier, 18 had had no further attack. In the other two the subsequent attack began elsewhere than at the place injected. Controls in which novocaine only is being injected are being tried.

ii. A number of observers have shown that there may be grouped together, particularly in lymphatic glands, adult filariae living, dead, and calcified. A mass comprising testicle, hydrocele and spermatic cord removed after death was subjected to X-rays. "Scattered throughout its shadow are small elongated ovoid areas of calcium density which range in size from about 1 mm. in width and 2 to 3 mm. in length to tiny dots" either single or in chains of 2 or more. Some of these were examined and shown to be calcified filariae. In a woman suffering from attacks of filarial lymphangitis, accompanied by tender areas as mentioned and with commencing elephantiasis, X-ray photos showed certain shadows in these tender areas provided the limb was arranged so that they lay in profile. Three such areas were excised and report is made on an examination of two out of five portions of one of them, these being two in which the rays showed shadows. Worms were found in both portions, and were considerably or only faintly calcified. Fibroblasts and multinucleated giant cells were present. A fibrous capsule surrounded a worm with no evidence of living endothelial cells. The worm appeared to be lying in connective tissue and the blood vessels near it were enormously thickened or even occluded. Other cases are cited.

"These studies seem to indicate that the infection may be quite extensive. Since six worms were found in a small subcutaneous area it is possible that many others might be revealed by a long and careful search. Fifteen shadows or groups of shadows were detected in one elephantoid leg. . . . Inasmuch as excision of 'focal spots' containing living worms from an elephantoid leg has been followed by improvement in symptoms, the roentgen demonstration of calcified filariae may aid in localizing the attack on the disease."

C. L.

KORKE (Vishnu T.). **Observations on the Atypical Variety of *Bancrofti* and its Significance. Part IV.**—*Indian Jl. Med. Res.* 1929. Apr. Vol. 16. No. 4. pp. 1023–1032. With 12 figs. on 1 plate. [6 refs.] [Central Research Inst., Kasauli.]

The average measurements of 20 "atypical" microfilariae from Balasore, Orissa, are compared with 18 typical forms. The first of the paired measurements which follow are from typical, the second from atypical microfilariae. They signify the distance from the head end as a percentage of the total length. Cephalic space 6 to 10 against 4 to 6, nerve ring 20 to 21 against 19·6, excretory pore 29 to 32 against 28·6, anal pore 80 to 85 against 77·5, the last tail cell 95 to 97 against 93. Thus the unnucleated tail portion is longer, it is abruptly drawn out,

bulbous towards the middle, then straight but deflected at an angle, the bulb having one granule and the rest about three. The characters, it is noted, approach those of *Mf. malayi*, the atypical forms appear to be associated with areas where elephantiasis of the lower extremities is present, while the typical forms are connected similarly with hydroceles.

C. L.

Acton (H. W.) & Rao (S. Sundar). **The Importance of Secondary Infections in the Causation of Filarial Lymphangitis.**—*Indian Med. Gaz.* 1929. Aug. Vol. 64. No. 8. pp. 421–423.

The authors summarize the results of two years' investigation. Lymphatic obstruction in filariasis is : (*a*) chronic, usually aseptic, the result of helminthic damage to the glands ; (*b*) acutely inflammatory with secondary invasion by a micro-organism which after close search they have nearly always found already occupying some primary focus elsewhere. A primary focus occupied by some kind of micro-organism they have always found, though the micro-organisms in this focus and in the acute lymphangitis have not always been the same. The primary focus may be external and usually temporary, a traumatic lesion, or tinia infection ; or it may be internal in the mouth or gut. They have invariably found that removal of the oral focus or treatment of, say, dysenteric ulceration has caused disappearance or great reduction in frequency and gravity of the acute lymphangitic attacks. The cases tabulated number 28. In one the only "focus", an internal one, is described by the single word " hookworm."

C. L.

Acton (H. W.) & Rao (S. Sundar). **" Kataphylaxia ", a Phenomenon seen Clinically in Filariasis.**—*Indian Med. Gaz.* 1929. Nov. Vol. 64. No. 11. pp. 601–610. With 20 figs. (2 coloured) on 4 plates. [15 refs.]

The authors consider kataphylaxia, or localized failure of the defence mechanism, under the heads epiblastic as when loss of the keratinized epithelium allows entry of micro-organisms, mesoblastic as when the pulmonary passage of hookworm and ascaris larvae is followed by a [bacterial] pneumonia or bronchitis, and hypoblastic as when an intestinal lesion allows *Bact. coli* to enter the tissues. They have been unable to demonstrate a toxin in *Filaria bancrofti*, mainly from the difficulty experienced in recovering adult worms, but point to eosinophilia as an evidence that one exists. For two reasons they believe that the toxin is poured out with the embryos. Firstly, in 100 cases with microfilaria in the night blood the eosinophilia percentage was 8·96; in 100 with " such types of filarial infection as filarial lymphangitis or lymphatic obstruction " but no microfilariae it was 4·62. Secondly, the lumen of a lymphatic vessel which they sectioned contained many desquamated endothelial cells about the head end of a gravid female filaria which it contained and few about the tail end—and the vulva lies near the head end. The bacterial toxins of a secondary bacterial infection produce a polymorphonuclear reaction. An endothelial plug

such as they reported, and post inflammatory fibrosis with contraction, would cause lymphatic blockage. Parturition and irritation are regarded as occurring intermittently for a few days only in each month, the evidence for this suggestion not being stated.

The commonest site in which the authors have found adult filariae is apparently not in the main abdominal lymphatics, but in those vessel which lie at the hilum of a gland or which are varicosed. Immature forms they have found in narrow vessels, either small lymphatics or those narrowed by fibrosis, a finding explained as an aberrant but active migration marked by " endeavour," a migration which is undertaken when main passages are blocked. The different clinical manifestations of filariasis are explained on the dosage of infecting immature forms which is received. When the dosage is small and spaced, little irritation is induced by the passage of infecting forms and few symptoms result ; when the dose is large and frequent, inflammation and obstruction are great. A coloured plate shows a gland removed from the vicinity of leprous lesions and containing a young male worm in a giant-cell-containing tissue with central necrosis, and another with oedema round the contained filaria.

It would appear, then, that the symptoms of obstruction are attributed by the authors in great part to immature forms.

C. L.

Pandit (C. G.), Pandit (S. R.) & Iyer (P. V. Seetharama). **The Adhesion Phenomenon in Filariasis : a Preliminary Note.**—*Indian Jl. Med. Res.* 1929. Apr. Vol. 16. No. 4. pp. 946–953. With 3 figs. on 2 plates. [2 refs.] [King Inst. of Preventive Medicine, Guindy, Madras.]

The technique consists in mixing 8 cc. of night blood containing *Mf. bancrofti* with 2 cc. of a 2 per cent. citrated normal saline solution. Equal quantities of this mixture and of the serum to be tested are then intimately mixed in tubes and " incubated " at room temperature overnight. Next morning (one to two hours, however, suffices) the tube is rolled between the fingers to mix its contents and a drop examined under the microscope. In a positive reaction microfilariae become sluggish or perish and are coated with adherent leucocytes. Red corpuscles do not adhere. In 32 cases of active elephantiasis having no microfilariae in the night blood the reaction was positive in 25 ; in 10 with blood microfilariae but no clinical lesions there was no reaction ; in 3 with no microfilariae but with a history suggesting transient filarial infection many years earlier one showed the phenomenon ; in 13 healthy persons 3 showed adhesion ; two had lived long in highly filarial areas, the history of the other was not available. The reaction begins within an hour, at which time microfilarial activity is still marked. Bacteria and yeast cells are not attracted. The presumed antibody is unaffected by a temperature of 56° C., the phenomenon does not take place with other microfilariae and occurs equally well under air, CO_2 or H_2. Sera from cases of elephantiasis with microfilariae in the blood have not been investigated, being very rare in the area concerned. It is suggested that the absence of microfilariae in elephantiasis is explained by the action of this phenomenon.

C. L.

Coutelen (F.). Essai de culture *in vitro* de microfilaires de Bancroft. [**Culture *in vitro* of Bancroft's Microfilaria.**]—*Ann. Parasit. Humaine et Comparée.* 1929. Sept. 1. Vol. 7. No. 5. pp. 399–409. With 2 text figs. [17 refs.] [Parasit. Lab., Faculty of Med., Paris.]

About 50 cc. of blood was removed from a man with nocturnal microfilarial periodicity and the serum divided into three equal portions. One remained as a control, to the second was added an equal volume of normal saline, and to the third every four days 2 cc. of a 1 per cent. glucose solution in normal saline. The whole was prepared and maintained under conditions of strict sterility, and samples were removed from the bottom of the tube as required for periodical examination. The larvae lived as long as 32 days. After some days they lost their sheaths; the central body had disappeared completely in 20 days; the length was increased by a fifth and the width doubled in 30 days, and there appeared digestive, excretory, and genital outlines, the result of active multiplication of somatic or genital cells. The changes took place at laboratory temperature, whose level—an important point—seems nowhere noted.

C. L.

Brangwin (C. H.). **Treatment of Filariasis Bancrofti.** [Memoranda.]—*Brit. Med. Jl.* 1929. Sept. 21. p. 539.

A case with elephantiasis of a leg showed in the night blood "numerous *Filaria bancrofti*." He received weekly injections of 1 cc. of moogrol. After six injections the calf had lost ¼ to ½ an inch in circumference weekly. The blood was not again examined.

C. L.

Acton (H. W.) & Rao (S. Sundar). **A Case of Filarial Abscess.**—*Indian Med. Gaz.* 1929. Nov. Vol. 64. No. 11. pp. 631–632. [2 refs.]

From an acute abscess in the right femoral region were obtained incomplete but living adult filariae 22 and 10 mm. long and full of eggs and nearly mature embryos, and also a haemolytic streptococcus which was also found about some teeth and in the urine obtained by catheter. The faeces were free from it and from protozoa and helminthic ova.

C. L.

Morenas. Un cas de filariose dû à *Acanthocheilonema perstans* avec manifestations cliniques et grosse éosinophilie. [**Infestation by *Acanthocheilonema perstans*, with Clinical Signs and High Eosinophilia.**]—*Bull. Soc. Path. Exot.* 1929. May 8. Vol. 22. No. 5. pp. 325–330.

A man who died with fibrosis of the left ventricle and a hypertrophied spleen, dyspnoea and oedema, had had an eosinophilia of 50, 35 and 19 per cent. and had been treated warily with stibyal. *Mf. perstans* had been present in the blood, but no adults were found in the serous membranes at autopsy.

C. L.

Vogel (Hans). Ueber *Mikrofilaria demarquayi* und die Mikrofilaria aus Tucuman in Argentinien. [*Mf. demarquayi* **and the Microfilaria from Tucumán.**]—*Abhandl. a. d. Gebiet d. Auslandskunde, Hamburg. Univ.* 1927. Vol. 26. (D. Med. & Vet. Vol. 2.) [Festschrift Nocht.] pp. 573–584. With 4 text figs. [20 refs.] [Inst. for Ship & Trop. Diseases, Hamburg.]

Manson named *Mf. demarquayi* in 1895 from blood smears obtained from St. Vincent and St. Lucia in the West Indies. In 1914 Aroaz and Biglieri found a microfilaria in the Province of Tucumán in North Argentina and named it *Mf. tucumani*. Vogel has measured and examined about 40 specimens of the reputed new species and compared them with a nearly equal number of *Mf. demarquayi*. The minute anatomy, the size, and the relative distances of the various fixed points recognized in microfilariae lend no weight to the suggestion that these are two species.

C. L.

Hoffmann (Carlos C.). Nota sobre la existencia de la *Microfilaria ozzardi* en la Península de Yucatán. [**Embryos of** *Filaria ozzardi* **in Yucatán.**] —*An. Inst. Biol. Univ. Nac. Mexico.* 1930. Vol. 1. No. 1. pp. 55–57. With 1 text fig. [3 refs.]

The author states that *Microfilaria ozzardi* had not been recorded previously in Yucatán. He found them in a considerable number of specimens of blood examined in 1927 and 1928, his diagnosis being confirmed by Professor Fülleborn.

H. H. S.

Peón (I. E.). **Loa Loa—Case Report.**—*Eighteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1929. pp. 229–231. [Chiriqui Land Company Hosp., Puerto Armuelles, Panama.]

Two years after leaving the West Coast of Africa, a series of Calabar swellings appeared on various parts of the face of a sturdy man during six days only. Eleven months later the man was awakened by "something biting" in the left external canthus. A loa was removed under cocaine. He next had tartar emetic intravenously in 6 increasing doses over 3 weeks, amounting in all to 0·25 gm., and 3 days later a course of 4 doses of neosalvarsan, 1·95 gm. in all, over 20 days was begun. Under the latter, microfilariae greatly lessened, but were present in large number about a month later.

C. L.

Sharp (N. A. Dyce). *Loa loa* **Infections. A Case with Rapid Onset of Symptoms.**—*Lancet.* 1929. Oct. 12. pp. 765–766.

One week after the probable date of infection, namely, a day on which he was severely attacked by chrysops, or 61 days after the earliest possible date of infection, namely, that on which he first landed in West Africa, a man of 23 began to manifest Calabar swellings at short intervals about the upper limbs and head. On one occasion there was a sensation as of something moving (near the knuckle of the right ring finger), but no worm has been visible. Eosinophilia is present. Neither the emission of microfilariae nor the death of worms, the two causes put forward for these swellings, meets this case.

C. L.

LAIGRET (J.). Onchocercose humaine et éléphantiasis au Soudan français. [**Onchocerciasis and Elephantiasis in Man in the French Sudan.**]—*Bull. Soc. Path. Exot.* 1929. June 12. Vol. 22. No. 6. pp. 499–506. With 4 plates. [8 refs.] [Vaccine & Biol. Lab., Bamako, Sudan.]

After surveying the steady extension of the area in Africa known to contain *Onchocerca volvulus*, Laigret gives the result of his recruiting experience in Bamako and Bougoumi, French Sudan. In Bamako 4·5 per cent. of 3,860 young men between 16 and 25 years showed onchocerca cysts. In Bougoumi percentages were as high as 45 in humid areas. Cysts were mostly about the anterior superior iliac spines and trochanters, thoracic cysts being relatively rare. Cutaneous lesions are described, namely, keratodermia, xerodermia and a pseudo-ichthyosis without desquamation, and affect 50 per cent. of those who have cysts. Elephantiasis cases rarely reach the recruiting medical officer; but regarding those seen there was no evidence of onchocerca infection in the old ones; in early cases, cysts and microfilariae in sections and on puncture of glands are detected. Onchocerca infection was rarely permitted to exempt from service. C. L.

i. HOFFMANN (Carlos C.). Investigaciones sobre la transmision de la Onchocercosis de Chiapas. [**The Transmission of Onchocerciasis in Chiapas.**]—*An. Inst. Biol. Univ. Nac. Mexico.* 1930. Vol. 1. No. 1. pp. 59–62. With 2 text figs.

ii. OCHOTERENA (I.). Contribución para el conocimiento de la Onchocercosis en Mexico. [**Onchocerciasis in Mexico.**]—*Ibid.* pp. 77–82. With 5 text figs.

i. The species of onchocerca found in Mexico is *O. caecutiens*. The author found filarial embryos in the stomach of two species of simulium, *S. mooseri* and *S. ochraceum*, shortly after they had fed upon a patient. Further investigations showed that development proceeded normally in the former, but that the embryos soon disappeared from the latter, as if this species possessed defences against the parasite.

ii. The second paper describes the finding of numerous embryos in the excised eye of a blind man; the eye was fixed entire and serial sections made. The embryos were aggregated particularly "in the outer third, in the corneal epithelium." H. H. S.

DEL FAVERO (E.). Localizzazione abnorme di *Filaria medinensis* in seno ad una ghiandola inguinale. [*Filaria medinensis* **found in an Inguinal Gland.**]—*Arch. Ital. Sci. Med. Colon.* 1928. May. Vol. 9. No. 5. pp. 277–280. With 1 text fig. [4 refs.] [Inst. of Exot. Path., Univ., Padua.]

Diagnosis of the worm rests on the statement of the writer and the observation that in the fluid round it there were very many microfilariae with cylindrical body ending in a filiform tail. The subject was an Indian from Bombay and Aden. C. L.

SMILLIE (W. G.). **Hookworm Disease.**—Reprinted from *Nelson Loose-Leaf Medicine.* 1928. Nov. Vol. 2. pp. 477–490G. With 11 text figs.

It is noted that even mild hookworm infections are important, and that the disease constitutes one of the gravest menaces to physical,

mental and economic progress. The descriptions of the parasites will probably not convey a clear impression of the anatomy as it is, nor does Smillie appear to accept the specific identity of *A. braziliense* and *A. ceylanicum*. Under the life history and mode of infection is found a good account of the matter as it stood at the beginning of 1928. Pathology, including the blood picture, is next taken up. Persons with 25 worms or less are classed as carriers, whom it is held seldom advisable to treat on the ground that the results achieved would not compensate the individual for the discomfort and slight hazard involved. Under diagnosis by microscopic examination of faeces there are mentioned direct smear, Willis method, Caldwell method, and D.C.F., and it is added that these various methods are very accurate in determining whether or not a patient harbours hookworms, but if this implied uniformity were the general experience, none would have troubled to devise and test ovum concentrative methods. For the determination of the degree of infection Stoll's method of egg counts with its implications and its allowances for stool consistence are advised. Treatment occupies an adequate proportion of the total space ; the best method is held to be by a mixture of carbon tetrachloride and oil of chenopodium on the ground that neither increases the toxicity of the other. This seems to express general opinion on the matter, though the abstractor believes it to be contrary to the facts.

C. L.

Alfejew (Sophie). Zur Frage ueber die Wanderung der Ascariden und Oxyuren im Gewebe der Darmgeschwulst beim Menschen.—*Ztschr. f. Parasitenk.* Berlin. 1928. Oct. 27. Vol. 1. No. 3. pp. 423–436. With 7 text figs. [40 refs.] [Path.-Anat. Inst., & Zool. Inst., Milit. Med. Acad., Leningrad.]

Banajtis (S. I.). Oxyuren und Appendicitis.—*Arch. f. Med. Wiss.* 1929. Vol. 2. No. 1 (4). pp. 115–128. With 1 text fig. [14 refs.] [In Russian. German summary p. 129.]

Faust (Ernest Carroll), Campbell (Horace E.) & Kellogg (Claude R.). Morphological and Biological Studies on the Species of Diphyllobothrium in China.—*Amer. Jl. Hyg.* 1929. May. Vol. 9. No. 3. pp. 560–583. With 8 text figs. [3 pages of refs.] [Peking Union Med. College, Peking, & Med. School, Tulane Univ., New Orleans.]

Fitzgerald (R. D.). Notes on a Case of Dracontiasis.—*Malayan Med. Jl.* 1929. June. Vol. 4. No. 2. p. 78.

Joyeux (Ch.), Gendre (E.) & Baer (J. G.). Recherches sur les helminthes de l'Afrique Occidentale Française. Monographie II. Collection de la Société de Pathologie Exotique.—120 pp. With 52 text figs. 1928. Paris : Masson et Cie., Editeurs, 120 Boulevard St. Germain. [20 Fr.—4s.]

Ku Yue Chi. Ueber Paragonimiasis Westermanni.—*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. May. Vol. 33. No. 5. pp. 287–299. With 2 text figs. [48 refs.]

Matzinger (Walter). Ueber die Askaridenallergie bei Säuglingen und die Spezifität der Askaridenreaktion.—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1929. Vol. 60. No. 5/6. pp. 399–410. With 12 text figs. [15 refs.] [Dermat. Clinic, Univ., Zurich.]

Nauck (E. G.) & Picado (C.). Fischfang und Wurmabtreibung durch " Latex." —*Arch. f. Schiffs- u. Trop.-Hyg.* 1929. Oct. Vol. 33. No. 10. pp. 536–542. With 2 text figs. [San Juan de Dios Hosp., San José, Costa Rica.]

Weiss (Kurt). Kürbiskerne als Bandwurmmittel.—*Muench. Med. Woch.* 1928. Mar. 23. Vol. 75. No. 12. pp. 520–521.

Erratum.

Vol. 27, No. 6, p. 459, 2nd summary, line 7 of text. For *opressa* read *oppressa*.

LEPROSY.

LEPROSY REVIEW. 1930. July. Vol. 1. No. 3. 32 pp. Quarterly Publication of the British Empire Leprosy Relief Association, 29, Dorset Square, London, N.W.1.

This number includes an account of leprosy in Ceylon, with 1,000 known and an estimate of 3,000 lepers, with encouraging results from treatment in the early stages; and in the Assam hill state of Manipur, where 57 cases have been discharged as probably cured from the Kangpokpi Leper Colony under Dr. G. G. CROZIER. In Persia H. A. LICHTWARDT reports that alepol is less painful, and in 3 per cent. solutions intramuscularly and 1 per cent. ones intravenously yields more rapid good results than the ethyl esters, and the clinic is now attracting patients from as far as Russia and Afghanistan, as well as Persia. F. W. ROSS reports on a year's work on a Bengal treatment centre, which he started in some trepidation, but 250 lepers from an area of 100 miles now attend the weekly clinic with promising results. T. B. WELCH, in Trinidad, reports the successful control of febrile reactions after injections with a powder, orally, containing Aspirin grs. 10, Phenacetin grs. 5, Pulv. Ipec. Co grs. 5, with the addition of Calomel grs. 4 to the first dose. The patient is wrapped in a blanket and hot bottles are applied morning and evening.

L. Rogers.

LEPROSY IN INDIA. 1930. July. No. 3. pp. 83–122. With 3 text figs. Issued quarterly by the Indian Council of the British Empire Leprosy Relief Association.

Among several short articles in this number is one by MUIR on the treatment of residual leprosy, in which he advises control of dosage by the sedimentation test and pushing ethyl esters and iodides when it is below 20. Dr. GUPTA deals with anti-leprosy surveys and dispensaries, and he estimates the cost of a survey and treatment party of five officers for one year at Rs. 13,200. Other articles deal on well-known lines with personal prophylaxis of workers, routine examination of nasal smears and how to maintain attendances at clinics. Brief reports of four leprosy centres are also given.

L. R.

CHINA MEDICAL JOURNAL. 1930. Aug. Vol. 44. No. 8. pp. 737–883. **Special Leprosy Number.**

This number contains much detailed information regarding the incidence of leprosy in the different provinces of China in the form of reports on different areas, together with an interesting account of the early history of the disease by K. Chimin WONG with references to ancient literature, which indicate that the disease has been prevalent since the sixth century B.C. and that the earliest reference to use of chaulmoogra oil in the treatment of leprosy was during the 14th century A.D. Brief articles on the work of the Mission to Lepers by W. H. P. ANDERSON and on treatment by E. MUIR, by HEIMBURGER and YU, and at Tsinan by WATSON, and one on Ridding China of Leprosy by J. L. MAXWELL follow. In the last, compulsory notification, with dis-

pensary and hospital treatment on penalty of segregation if the patients do not attend, together with examination of all contacts twice a year to detect early cases, and segregation in homes and colonies of advanced infective cases are advocated. At Tsinan 110 cases have been treated and 38 were paroled as bacteriologically free. Gold preparations were useful in addition to hydnocarpus oil.

The contribution of A. J. WATSON contains some interesting observations in addition to a résumé of the recent advances in treatment. While sympathizing with English dermatologists who have failed to cure cases, he states that " those who have seen leprosy lesions clear up under chaulmoogra injections need no convincing of its value," and he goes on to deal with the chemistry of the oils and refers to the bactericidal effects of chaulmoogrates and hydnocarpates on acid-fast bacilli shown by WALKER and SWEENEY. He records his own experiments to show that ROGERS' sodium hydnocarpate (Alepol) inhibited the growth of the acid-fast *B. rabinowitsch* up to dilutions of 1 in 1,000,000, but oleates had no such effect, and other classes of bacilli, such as *Ps. pyocyanea*, are not affected by either. This shows a selective action of hydnocarpates on acid-fast bacteria of a most instructive nature, and he suggests that this action may be due to adsorption or solution of the acid in the fatty or waxy envelope of the bacilli. The significance of the lepra reaction is next discussed with illustrative temperature charts, and he points out in an analysis of the results of treatment in a considerable number of cases, that in those in which reactions are absent the treatment fails, but those showing repeated slight reactions always improve (as held from the first by ROGERS); during reactions congestion of the lesions with a polymorphonuclear reaction occurs, with the result that the drug can gain access to the bacilli and destroy them by bacteriocidal action, while in non-reacting failures the drug may never reach the bacilli deeply situated in advanced lesions. Hence the well-established good results in early cases, while the failures were all of over five years' duration. In an appendix he quotes the work of ADAMS, STANLEY and other American chemists to show that chaulmoogric preparations of low molecular weight have greater bacteriocidal action than the higher ones, and he points out that this confirms ROGERS' preference for the lower melting point fatty acids of these oils, such as sodium gynocardate, and that the same principle is embodied in his latest preparation, alepol.

L. R.

GOLD COAST. **Brief Report on the Leper Settlement, Ho, 1928-29** [COOKE (F. H.), Medical Officer].—*Gold Coast Rep. on Med. & San. Dept. for Year 1928–1929.* Appendix D. pp. 125–127.

——. **Report on Leprosy by the Medical Secretary to the Gold Coast Branch of the British Empire Leprosy Relief Association** [DIXEY (M. B. Duncan)].—*Ibid.* Appendix E. pp. 127–132.

Dr. F. H. Cooke reports on the further progress during 1928–29 of the Leper Colony at Ho, in the Togo area of the Gold Coast, which owes so much to him. The construction of a permanent settlement enabled the resident inmates to be raised from 95 to 350, making, together with 68 out-patients, a total of 418. During the year 5 were discharged " cured " and no less than 92 on parole as " apparently

cured," and they are seen monthly. For the year 1928–29 177 were so discharged, but 25 have been readmitted with nerve symptoms. The treatment used was alepol with moderate doses of potassium iodide, and it is stated that " After observing alepol treatment for over a year, I can say that the results warrant all the favourable reports on this drug published."

Dr. M. B. D. Dixey publishes his report for the year ending April, 1929, on leprosy work on the Gold Coast, which included extensive leprosy surveys and the formation of leper out-patient clinics at all stations with resident medical officers. He estimates the leprosy incidence at 7 per mille in the Ho district, where voluntary treatment and segregation have proved such a great success, as compared with the old German compulsory methods, that there are more voluntary applicants than can be accommodated. The nerve type forms 82 per cent. of the cases. In Accra nerve cases formed 56 per cent. After giving details of the lepers seen at various clinics, he concludes with the following important statement :—

" If one may judge from experience in other parts of the world, it may be stated with some confidence that the method of voluntary segregation in settlements, where modern methods of treatment can be employed, will be found more suitable than any compulsory methods, which will only lead to the hiding of cases till the disease is past the most remedial stage."

L. R.

NIGERIA. **Report of the Nigerian Branch British Empire Leprosy Relief Association, 1928** [MAYER (T. F. G.), Secretary.]—*Ann. Med. & San. Rep. Nigeria, 1928.* Appendix K. pp. 153–156. With 1 folding map.

After describing the foundation of the Nigerian Branch of the British Empire Leprosy Relief Association, figures are quoted to show 2,046 lepers, including 616 in-patients in 1927, and 2,112 in-patients and 863 out-patients, a total of 2,975, in 1928. As the result of a long tour Dr. Mayer advocates the establishment of self-supporting colonies, where both the early and the infectious cases may be treated and their children protected from infection. He reports that the Native Administrations are intensely interested in the matter, and will welcome and assist the formation of treatment centres in their midst. A large map showing the medical centres and activities of the Province completes an interesting report.

L. R.

RAMSAY (G. W. St. C.). **A Study of Leprosy in Southern Nigeria.**—*Ann. Med. & San. Rep. Nigeria, 1928.* pp. 89–98. [6 refs.]

This is a further report on the work of the Leper Colony at Itu, founded by Dr. MACDONALD, and managed by the United Free Church Mission. The incidence of the disease is estimated at the high rate of 30 per mille in parts of Southern Nigeria, and the people are scattered over countless small farms, so compulsory segregation is impracticable. As large numbers of lepers had camped near Itu for the sake of treatment, a colony has been formed on thirty acres given by Government, much of their food is grown by the patients, and the population is now over 600, about two-thirds being males. An analysis of 616 cases

showed that the duration of the disease varied from 2 months to 30 years, with an average of 6·1 years, and in three-quarters the disease began between the ages of 16 and 35 years. The people recognize the early stages, and no less than 80 per cent. are maculo-anaesthetic and only 4·4 per cent. nodular. As a whole, the cases are of recent origin and favourable for treatment, and less than 10 per cent. of the maculo-anaesthetic cases showed lepra bacilli in their nasal smears.

L. R.

HAYES (T. H.). **Leprosy in the Virgin Islands.**—*U.S. Nav. Med. Bull.* 1930. Apr. Vol. 28. No. 2. pp. 292–309.

Leprosy was apparently introduced here by the slave trade and from other West Indian Islands long ago, and in 1888 a leper house was opened and 29 patients admitted, or about one-fifth of the known lepers according to EHLERS. Segregation was very imperfect, and during the sixteen years up to 1903, 127 lepers were received, 34 remained in the home, and 73 had died. In 1896 82 cases were found. In 1904 EHLERS advised the same system of segregation as he used in Iceland, and he collected funds in Denmark for a new isolated leper colony in 1908, which is still at work, with 79 inmates in 1927, and a probable total of about 90, or 3·45 per mille. in the Islands. There is a high proportion of young cases, indicating recent spread in the favourable hot humid climate. Land permits the lepers to grow crops, the sexes are separated, and a native nurse and treatment are provided. Females preponderate, as they attend hospital most, and are there detected. The cases are mainly of the mixed type; release of "burnt-out" nerve cases is advised to lessen congestion of the colony. Ethyl-esters have produced gratifying progress in some cases.

L. R.

HURWITZ (Ezra). **Palo Seco Leper Colony.**—*Rep. Health Dept. of the Panama Canal for Year 1928.* pp. 49–53. With 2 plates.

This is a brief description of the leper colony in Panama with 103 inmates. Marriages are occasionally allowed, but children of leper women are removed at birth and placed with relatives. Ethyl-ester treatment is used and 34 cases have become negative bacteriologically, but most are crippled.

L. R.

BRAY (George W.). **The Story of Leprosy at Nauru.**—*Proc. Roy. Soc. Med.* 1930. July. Vol. 23. No. 9. pp. 1370–1374 (Sect. Trop. Dis. & Parasit. pp. 26–30).

This is a most instructive and encouraging account of the application of modern methods in dealing effectually with a most serious leprosy epidemic in a small Oceanic island under Australian administration. The disease was unknown before 1912 and was probably introduced by a Gilbert Island woman; in 1920 four cases were known, including a girl who had frequently visited the first patient. In October, 1920, 30 per cent. of the whole population of 2,500 died of influenza, and great ill-health and debility remained, together with a definite dietary deficiency, and 3 of the lepers died. Under these unfavourable

conditions, leprosy increased so rapidly that, within four years of the influenza epidemic, no less than 30 per cent. of the whole population were infected, and of the first 34 cases, 9 were relatives of the surviving early leper, and 3 more of one of those who died during the epidemic. With the exception of one district, nearly every family was infected, so practically every native had been in contact with a leper. No less than 90 per cent. of the cases were of the maculo-anaesthetic and 5 per cent. each nodular or nerve cases.

The paper goes on to relate "The Story of the Conquest" in which early diagnosis was by means of monthly examination of all the people, and bacteriological examinations with segregation on one side of the Island of infective cases, and treatment of the bacteriologically negative cases as out-patients, but with separate sleeping accommodation from the uninfected. During 1927, 67,000 injections were given of chaulmoogra and hydnocarpus preparations; the maximum number of cases was reached in 1925 with 189 segregated and 176 treated as out-patients at clinics, or a total of 365; 30 per cent. of the population and the worst epidemic on record as far as the reviewer knows. Yet within three years the number of cases remaining had fallen to 132 segregated and 86 treated at clinics; a total of 218, or a 40 per cent. reduction within three years. Great attention was paid to cleanliness, diet and recreation and a good sign is the diminution in the number of children affected each year, since they are most susceptible. [The success of the above plan is very gratifying to the reviewer as he advocated it in "Leprosy", and some years ago he was consulted regarding the Nauru outbreak and advised the methods above described. Moreover, Dr. Bray has informed him that not a single early discovered case has gone on to the nodular stage, so the Nauru experience strikingly confirms his contention that the frequent examination of all leper contacts and the immediate treatment of the earliest stages thus discovered is the key to the elimination of leprosy from any country, and consequently anything which leads the early cases to be hidden is harmful.]

L. R.

Kaiser (L.). Leprabestrijding en leprabehandeling in de Onderafdeelingen Madjene en Mamasa (Celebes en Onderh.) in 1925–1929. [**Combating and Treatment of Leprosy in Madjene and Mamasa (Celebes).**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1930. July 1. Vol. 70. No. 7. pp. 712–724. With 2 text figs. & 4 figs. on 2 plates.

This article contains much information on the frequency of leprosy in these districts and their subdivisions, which is merely of local interest. The leper colony Kampong Baroe, founded upon the principle of voluntary segregation and self-management of the lepers, is described in some detail. The treatment administered in the colony aims at

(1) Treatment of the local affections of the skin (ulcers, complicating affections like scabies, etc.).

(2) Specific treatment as far as possible by means of a mixture of: chaulmoogra oil 20, thymol 9, camphor 3.

(3) Treatment of intercurrent diseases.

(4) Psychical treatment of the lepers especially supports their belief in the possibility of a cure.

W. J. Bais.

ARAUJO (H. C. de Souza). Curso de leprologia pelo radio. [**Broadcasting Lectures on Leprosy.**]—*Rev. Med.-Cirurg. do Brasil.* 1930. Mar. Vol. 38. No. 3. pp. 89–108.

In this article are given the first three of a prepared series of 14 broadcastings on the subject of leprosy. They are of general interest as being addressed to the laity. The first deals with the problem of leprosy in Brazil, the second as it affects S. Paulo in particular, the third the scheme for dealing with the disease in S. Paulo, with an account of the St. Angelo leprosarium and the cost of upkeep of the staff of this and other institutions, and of providing for inspection and prophylaxis.

H. H. S.

LABERNADIE (V.). Contribution à l'étude de la contagiosité de la lèpre. [**The Contagiousness of Leprosy.**]—*Rev. Méd. et Hyg. Trop.* 1930. May–June. Vol. 22. No. 3. pp. 114–137. [Refs. in footnotes.]

This is a lengthy argument on the contagiousness of leprosy in the light of the incidence of the disease among French convicts living in French Guiana, as opposed to the old heredity theory. He points out that to account for the number of cases seen in these convicts, who lived in close contact with the infected indigenous population, on the heredity theory, there should be half a million cases of undiscovered leprosy in France, which is impossible. He concludes that contagion accounts for the incidence of the disease among the convicts, who were infected much in proportion to their opportunities of coming into contact with indigenous lepers.

L. R.

DE AMICIS (Arturo). °Lepra autoctona e contagio leproso. [**Autochthonous Leprosy and Contagion.**]—*Riforma Med.* 1930. July 7. Vol. 46. No. 27. pp. 1081–1084. With 4 text figs. [1 ref.]

The patient, a woman of 24 years, had always lived in Naples. When seen by the author in 1924 she gave a history of the outbreak of red patches on her face from time to time accompanied by fever, and of scattered patches on the trunk and limbs. Examination revealed maculae scattered over the body, a nodule on the right conjunctiva and a perforating ulcer on the sole of the right foot. Hansen's bacillus was present in large numbers in the nasal mucus. The only possible source of contraction appeared to be her former fiancé, a sailor who had been in America. Three years later this patient mentioned a brother as suffering from 'arthritis deformans' and on seeing him the author at once diagnosed nervous leprosy with atrophic and deforming lesions of the hand. Inquiry into his history revealed that from boyhood he had lived in close association with a man who had been noted in 1901 by the author's father, Professor DE AMICIS, as a case of autochthonous leprosy (since dead).

H. H. S.

AUBIN & LABERNADIE (V.). Le réflexe oculocardiaque chez les lépreux. [**The Oculo-cardiac Reflex in Leprosy.**]—*Bull. Soc. Path. Exot.* 1930. May 14. Vol. 23. No. 5. pp. 441–442. [Colonial Hosp., Pondichéry.]

Few studies appear to have been made of the sympathetic system in leprosy, so the authors have examined the oculo-cardiac reflex at

Pondichéry. They found among 100 cases, vagotonic reactions in 37, and sympathetico-tonic ones in 46, the latter being much more frequent in the anaesthetic type of the disease.

L. R.

Muir (E.). **Ganglion-like Swellings in Leprosy.**—*Indian Med. Gaz.* 1930. Aug. Vol. 65. No. 8. pp. 444–445. With 1 text fig.

A brief account with an illustration is given of the occasional occurrence of ganglion-like swellings on the back of the hand in leprosy, which may appear and disappear again rapidly and are believed to be connected with disease of the median nerve.

L. R.

Dizon (Elpidio Y.). **Eye, Ear, Nose, and Throat Manifestations in Leprosy.**—*Jl. Philippine Islands Med. Assoc.* 1930. May. Vol. 10. No. 5. pp. 211–216. [5 refs.]

The lesions of these special organs are described, and stress is laid on anaesthesia of the cornea leading to the presence of unfelt foreign bodies. Iritis and keratitis are the most common causes of reduced vision. The ciliary body was affected in about 1 per cent. of cases, but the choroid appears to be nearly exempt and the motility of the eyes is not affected. Chaulmoogra preparations should be used in eye effections, but with great caution to avoid reactions, and atropine drops and subconjunctival injections of atropin-adrenalin help to break down early adhesions of the iris ; salicylates and iodides are of use in iritis, with hot compresses to relieve the pain. The ear is only affected externally and the nose and throat symptoms are well known ; for the latter tracheotomy may be required.

L. R.

Hoffmann (W. H.) & Baez (Pedro Ramos). La coroiditis leprosa precoz. [**Early Choroiditis in Leprosy.**]—Reprinted from *Jl. dos Clinicos.* Rio de Janeiro. 1930. Aug. 15. Vol. 11. No. 15. pp. 225–233. With 2 coloured figs. on 1 plate.

The authors comment on the early signs of leprosy, which being very slight are liable to be overlooked, and thereby prognosis is rendered unfavourable, seeing that *early* treatment is necessary for cure to be attained. They then refer to a case, later described in detail, in which the only recognizable lesion was an ulcerative choroiditis of the right eye, and they recommend early examination by an ophthalmologist in suspicious cases.

The patient was a woman of 35 ; her father, mother, and two sisters were lepers, the father having died of the disease. This patient showed no general signs, and there were no acid-fast bacilli in the nasal mucus, but some ocular symptoms for which an ophthalmologist was consulted. He reported ulcerative choroiditis, believed to be tuberculous. The condition increased in spite of treatment. Antileprol was then given intravenously for 5 months, followed by krysolgan and that again by antileprol *per os.* Cicatrization of the lesions resulted, and 7½ months later there had been no recurrence nor any other signs of leprosy.

Professor Hoffmann remarks that for some years he has noted in patients at the Rincón leprosarium " the specific effect which gold salts, and especially krysolgan, has on leprous affections of the eyes."

H. H. S.

HOFFMANN (W. H.). **Gold Treatment of Eye Affections in Leprosy.**—*Jl. Trop. Med. & Hyg.* 1930. Aug. 15. Vol. 33. No. 16. pp. 233–236. [Finlay Inst., Havana, Cuba.]

This is a further paper on this subject in which the author claims to have used krysolgan in twenty-five cases of eye lesions in leprosy with benefit in all, but no details of dosage or results are recorded.

L. R.

MOTTA (Joaquin). Lepra latente y eritema polimorfo. [**Latent Leprosy and Erythema multiforme.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 479–484. [Dermat. & Syph. Clinic, Faculty of Med., Rio de Janeiro.]

Distinction is made between leprosy with long incubation period and latent leprosy in which the focus is deeply situated and gives rise to no symptoms, the bacilli remaining, as it were, inactive until conditions favourable to their extension arise. During this period there may be accessions of fever and transitory rashes, the cause of which usually escapes recognition. Other symptoms not uncommon are attacks of sweating, headache, transient or more persistent, slight or severe, rheumatic pains and some degree of anaemia. MARCHOUX and SERRA maintain that whatever the mode of infection spread takes place by the lymphatic system chiefly. In this paper the author confines his remarks mainly to the transitory erythematous rashes, and notes that many leprologists call attention to the similarity between the early maculae of leprosy and erythema multiforme and the diagnostic differences. The author takes the line that this condition is one which may be actually due to Hansen's bacillus as one of several causes.

He relates a case in point: A man of 30 years had an attack of fever with general pains and a sparse but widespread rash, involving face, ears, arms, thighs and legs, with slight itching and feeling of tension. It passed off in a week, but more minute examination revealed alterations of sensation, patchy areas of hypo- and hyperaesthesia. A small fragment taken for section revealed no bacilli, but one of the inguinal glands was a little enlarged and juice from it showed lepra bacilli in large numbers. The author is of opinion, therefore, that the rash was due to a transient toxaemia produced by the latent bacilli. [The aetiology of erythema multiforme not being single, it is quite possible that lepra bacilli may be one cause, but the proof in this case is not quite complete since a gland containing the organisms and a febrile attack with a transient rash are not necessarily interrelated.]

H. H. S.

LIE (H. P.). **Pathological Changes in the Central Nervous System in Leprosy.**—*Acta Path. et Microb. Scandinavica.* 1930. Supplement V. pp. 32–35. [1 ref.]

This is a short paper recording recent investigations on the central nervous system in leprosy; from these the author concludes that the degenerative changes affect only the primary peripheral neuron. Nodular leprosy also progresses slowly to assume the picture of nerve leprosy. On the other hand, he holds that mental disease is not directly due to the lepra bacilli or their toxins, but is of psychogenic origin.

L. R.

Molinelli (Ernesto A.) & Vaccarezza (Américo J.). El líquido céfalorraquídeo en la lepra. [**The Cerebrospinal Fluid in Leprosy.**] —*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 487–495. [10 refs.] [José Penna Inst. for Infectious Diseases, Faculty of Med. Sci., Buenos Aires.]

After surveying the findings of previous investigators the author details the results in 69 patients observed by him. He noted the general appearance of the fluid, its tension (by Claude's manometer), the content of globulin (by Pandy and Nonne Appelt); of albumen (nephelometer), glucose (Folin and Wu), chloride (Motr), urea (Ivon), cells per cmm., presence of lepra bacilli, the W.R. and Lange's colloidal gold test. Among the 69 were 21 with nervous leprosy varying in age between 16 and 63 years and suffering from the disease for periods varying between 1 month and 28 years; 17 of the nodular form, between 18 and 52 years, with disease from 1 to 19 years; 31 with mixed leprosy, between 18 and 71 years, and the disease from 1 to 23 years.

The investigation must have entailed much careful work and the results, though negative, are consequently of value from the view of academic research, but of no diagnostic or prognostic importance. The findings in each case were within the normal limits. In four cases (two nervous and two mixed) there was a slight modification of the Lange reaction, but not sufficient to be of clinical significance; though the W.R. was uniformly negative with the spinal fluid, the sera of two nervous, five nodular and ten mixed were positive. The details are presented in tabular form.

H. H. S.

Eubanas (Froilan). **Chemotherapy of Leprosy by the Use of Chaulmoogra Oil and its Derivatives and Other Synthetic Preparations.**—*Jl. Philippine Islands Med. Assoc.* 1930. May. Vol. 10. No. 5. pp. 203–210. [43 refs.]

A short historical review of modern treatments of leprosy, in which the author draws attention to the work of Roger Adams, of Illinois, in testing various synthetic acids of chaulmoogra on *Myco. leprae*, some of which are said to kill the organism in dilutions of 1 in 200,000. They may be worthy of clinical trial.

L. R.

Frazier (Chester N.) & Chen (Foong-kong). **Effect of Intravenous Injections of Ethyl Esters of Chaulmoogra Oil on the Pulmonary Tissues of the Rabbit.**—*Philippine Jl. Sci.* 1930. June. Vol. 42. No. 2. pp. 269–277. With 4 figs. on 2 plates. [8 refs.] [Peiping Union Med. College, Peking.]

The authors' experiments showed that when 0·2 to 0·3 cc. of chaulmoogra ethyl esters per kilo, or ten times the usual intravenous dose, although similar to amounts that have been given intramuscularly, are injected intravenously into rabbits they produced embolic obstruction and pulmonary infarcts followed by abscess formation, so if such an intramuscular injection entered a vein the results in man might be serious. Moreover, serial doses similar to those that have been given intravenously in man produced generalized pulmonary fibrosis in rabbits.

L. R.

Nolasco (J. O.). **Histopathology of Leprosy under Local Infiltration.** —*Jl. Philippine Islands Med. Assoc.* 1929. Oct. Vol. 9. No. 10. pp. 347–357. [12 refs.] [Path. Section, Culion Leper Colony, Philippine Is.]

The histological changes following the infiltration of leprotic tissues by chaulmoogra derivatives is of interest in view of the fact here recorded, that the amount of the remaining pathological material was found to be one-fourth to one-half as great in infiltrated as in unfiltrated lesions, after ten months such treatment, in spite of intramuscular injection being given in both series. The infiltrated lesions showed much more marked granulation of the lepra bacilli and large mononuclear leucocytes containing yellowish globules, but no proliferation of connective tissue around the lesions. The treatment excites a mild irritant inflammatory reaction.

L. R.

Peirier. Les " Caloncoba " à huiles antilépreuses du Cameroun. [**Antileprosy Oils from Caloncoba in Cameroon.**]—*Ann. de Méd. et de Pharm. Colon.* 1930. Jan.–Feb.–Mar. Vol. 28. No. 1. pp. 43–47.

Three varieties of these trees of the Flacourtiaceae order grow in the Cameroons in West Africa, and the oils of two of them, *C. welwitschii* and *C. glauca*, have been shown by analyses given in this paper to form oils in their seeds with very similar chemical and physical properties to chaulmoogra and hydnocarpus oils : it is proposed to try them in the treatment of leprosy.

L. R.

Williams (A. Winkelried). **Leprosy : Treatment by Means of a Special Vaccine.**—*Arch. Dermat. & Syph.* 1930. July. Vol. 22. No. 1. pp. 109–114. [2 refs.]

The author recalls that in 1914 he reported benefit in the treatment of leprosy by injections of vaccines prepared from sterilized lepra bacilli obtained from nodules of leper patients—after the failure of large doses of chaulmoogra oil orally, which was then the usual treatment.

L. R.

Aoki (T.). Beitrag zur Bedeutung des Jods für Diagnose und Behandlung der Lepra. [**Iodine in the Diagnosis and Treatment of Leprosy.**] —*Japan Jl. Dermat. & Urol.* 1930. Mar. Vol. 30. No. 3. pp. 213–224. [41 refs.] [In Japanese. German summary p. 27.]

The author reports on further trials of 5 per cent. sodium iodide intravenously in leprosy in 61 cases, usually in doses of 1 to 10 cc. These he finds to be of diagnostic value, and also of use in treatment, with favourable results in cases not reacting much ; severe reactions may do harm by disseminating the leprosy bacilli. The dosage must be varied according to the nature of the case.

L. R.

LABERNADIE (V.). Échec du traitement de la lèpre par l'iodure de potassium. [**Failure of Treatment of Leprosy by Potassium Iodide.**] —*Ann. de Méd. et de Pharm. Colon.* 1930. Jan.–Feb.–Mar. Vol. 28. No. 1. pp. 54–61.

The author reports a trial of Muir's method of using gradually increasing doses of potassium iodide up to very large ones in 17 cases, and he concludes that lepers often support very large amounts of the drug, but he has not observed any benefit from this form of treatment.

L. R.

PY (C.) & RIVEROS (M.). Tratamiento de las ulceraciones leprosas por la simpatectomia. [**Treatment of Leprotic Ulcers by Sympathectomy.**]—*5a Reunión Soc. Argentina Patol. Regional del Norte, Jujuy, 7 al 10 Octubre, 1929.* Vol. 1. pp. 408–419. With 10 text figs.

Ulcers of the legs and feet of lepers are common, often of large size, run a very chronic course, may be a fruitful source of infection and are usually very slow to heal. The chronicity is probably accounted for by the localization in a part where the skin is ill-nourished, where secondary infection is great and varied, and an ischaemic necrosis may be associated with local arteritis. Judging by the six recorded cases, four of ulcers on the leg and three (one patient had both) of perforating ulcers of the foot, the results of dividing the peri-arterial sympathetic nerves have been astonishing. The following are brief details of each :—

1. Male, 53 years. Leprosy 15 years, ulcer on leg and in sole of foot 6 months (resisting all local and general treatment). After sympathectomy under local novocaine anaesthesia, the leg ulcer cicatrized in 17 days, the perforating ulcer in 33 days.

2. Female, 49 years. Leprosy 16 years ; ulcer over external malleolus 10 months and measuring 9 and 8 cm. completely cicatrized in a month after operation.

3. Male, 43 years. Leprosy 8 years, ulcer with elephantoid condition 7 years, 7·5 and 6 cm. The latter condition cleared in 8 days and the ulcer healed in 22 days.

4. Male, 25 years. Leprosy 8 years. On right leg almost encircling the limb, 22 and 12 cm., and on the left leg one measuring 12·5 and 6 cm. The latter cicatrized in 12 days. In the case of the former the vessel was wounded and the femoral had to be ligatured.

5. Male, 35 years. Leprosy 8 years ; perforating plantar ulcer 4 cm. diameter cicatrized in a month.

6. Patient of 43 years. Leprosy 9 years ; perforating ulcer 2·5 cm. diameter healed in 35 days.

Photographs showing the condition before and after operation in three of these patients are given.

H. H. S.

LANG (Milton C.). **A Note on the Local Treatment of Leprous Ulcers.**—*Indian Med. Gaz.* 1930. May. Vol. 65. No. 5. pp. 274–275.

The author reports on the value of iodoform in the treatment of leprous ulcers, after trimming away dead or hardened flesh and applying

silver nitrate stick to indolent surfaces, opening up sinuses and removing dead bone, and he advises either 16 grains to an ounce of acetone or a 10 per cent. solution in eucalyptus oil applied locally on cotton wool.

L. R.

Cummins (S. Lyle) & Le Roux (J. J. du Pré). **Intradermal Tests with Extract of Leprous Skin in Cases of Leprosy and in Non-Lepers.**—*Tubercle.* 1930. Apr. Vol. 11. No. 7. pp. 299–303. With 2 figs. [1 ref.]

The fact that 70 per cent. of native recruits for the South African mines give positive reactions with tuberculin, yet are very susceptible to tuberculosis, raised the question whether some of the positive reactions may be due to latent infections with leprosy, since cases of that disease also react to tuberculin. To test this, Professor Lyle Cummins, during a recent visit to South Africa, carried out inoculations with leprolin supplied by Muir from Calcutta, but no confirmation of the presence of latent leprosy was obtained. Tests in definite lepers showed that maculo-anaesthetic cases reacted more strongly than nodular cases, but the results were somewhat irregular, although the tests indicate that the reactions in lepers are specific, since they are more frequent and more marked than in the non-lepers.

L. R.

Blanc (Georges), Joannidès (G.) & Pangalos (G. C.). La réaction de fixation du complément appliquée au séro-diagnostic de la lèpre avec un antigène méthylique de bacille de Kedrowsky. [**Complement Fixation in Diagnosis of Leprosy.**]—*Bull. Soc. Path. Exot.* 1930. June 11. Vol. 23. No. 6. pp. 568–574. [2 refs.] [Pasteur Inst., Athens.]

After referring to some previous work on the subject, the authors give full details of complement deviation tests they have carried out with methylic antigen made with the bacillus of Kedrowsky, with positive results in all of 12 nodular cases, and also in 5 out of 7 macular cases, and in 3 of 5 nerve cases. These figures are much higher than the reactions obtained with syphilitic and tubercular antigens, and the Kedrowsky antigen did not give positive reactions in diseases other than leprosy. This does not, however, allow of the conclusion that the Kedrowsky bacillus is the cause of leprosy.

L. R.

Gomes (J. M.) & Antunes (P. C. de Azevedo). Descio do complemento na lepra com o streptothrix leproide de Deycke desengordurado. Sensibilização dos pacientes e esta reacção pela administração de iodeto de potassio.—*Brasil-Medico.* 1930. Apr. 26. Vol. 44. No. 17. pp. 464–468. French summary.

—— & ——. La séro-réaction dans la lepre avec le *Streptothrix leproides* de Deycke, dégraissé. Sensibilisation au moyen de l'iodure de potassium. [**Sero-reaction with Streptothrix leproides.**]—*C.R. Soc. Biol.* 1930. May 1. Vol. 103. No. 14. pp. 1317–1318.

During the last three years the authors have used a serum reaction with defatted Streptothrix leproides of Deycke as a diagnostic measure

with good results in many cases, and they now state that sera taken at least a week after a dose of potassium iodide may give positive reactions in cases previously negative; but further work is required on this subject.

L. R.

AMIES (C. Russell). **The Rubino Reaction in Leprosy.**—*Bull. Inst. Med. Res. Federated Malay States.* 1929. No. 4. 16 pp. [32 refs.]

After dealing with the earlier literature, the author describes his own technique as follows :—

Sheep's blood corpuscles are obtained pure by repeated saline washing of defibrinated blood with the aid of the centrifuge, and treated with 6 per cent. formaldehyde brought to a hydrogen concentration of pH 7·4 with N/10 sodium hydroxide solution to preserve them, again washed in saline, and the original volume of blood obtained by adding saline and then preserved in the ice chest. Add 0·3 cc. of sheep's corpuscles to 1 cc. of the patient's serum in a small test tube, shake and place in incubator at 37° C., and note the degree of sedimentation at half-hour intervals. Complete sedimentation in half an hour is a positive reaction.

In 287 controls only 9 cases of typhus, 2 of pregnancy and 5 of various diseases were positive, whereas among 95 active leprosy cases 87 were positive, but none of 126 inactive cases ; so that the test is of little diagnostic value, but of much help as a guide to treatment, in the same way that the simple sedimentation test of the patient's blood is, since a positive reaction indicates a rest from injections of active drugs. Evidence is given to show that the positive reactions are due to an excess of globulin in the blood, and the contention of MARCHOUX and CARO that the reaction is due to a specific substance in the blood is disproved, for, contrary to their statement, heating the serum to 56° to 60° C. did not affect the result. The exact degree of pH is immaterial. The sera can be sent to a distant laboratory for Rubino's test.

L. R.

PEZZI (Giuseppe). L'albumino-reazione del muco nasale e la puntura delle ghiandole per la diagnosi precoce della lebbra. [**The Albumin Reaction in the Nasal Mucus and the Value of Gland Puncture in the Early Diagnosis of Leprosy.**]—*Ann. di Med. Nav. e Colon.* 1930. Mar.–Apr. Year 36. Vol. 1. No. 3/4. pp. 145–166. [2 pages of refs.]

In testing qualitatively for albumen in the nasal mucus the author used Tarchetti's modification of Boedeker's reaction [one of those employing dilute acetic acid and potassium ferrocyanide] ; for quantitative estimation, Kjeldahl's method. Thirty-two leper patients were examined, 19 of the nodular form, 7 of the anaesthetic, and 6 mixed. The disease had existed from 7 months to 8 years in the first, 2 to 17 years in the second and 2 to 10 in the third. In all but 2, anaesthetic cases, albumen was present, varying between a minimum of 1·50 and a maximum of 16 per 1,000. Of 21 controls, 7 syphilitics and 7 tuberculous, 7 suffering from other conditions such as leukaemia, carcinoma of stomach, lupus erythematosus, all were negative to the test except 1 case of lupus vulgaris. In short, the albumen reaction was constant in the nodular form, and most marked in the florid stage, less in degree in the mixed, least in the anaesthetic. The intensity of the reaction was found to be greatest in the earlier stages.

Gland puncture was performed on the same 32 lepers and the juice examined for Hansen's bacilli. Ten of the 19 nodular cases, 3 of the 6 mixed, but only 1 of the 7 anaesthetic were positive.

Lastly, both tests were made on 14 suspects or possible cases who had been in contact with leper patients, but who themselves presented no signs of disease. Nine gave a positive albumen reaction, from 1·2 to 15 per 1,000, and 2 revealed the bacilli in gland juice.

H. H. S.

Sonnenschein (Curt). Kultur von Leprabakterien auf Glyzerin-Ei- und Malachitgrün-Ei-Nährboden. [**Culture of Leprosy Bacilli.**]—*Zent. f. Bakt.* I. Abt. Orig. 1930. June 26. Vol. 117. No. 4/5. pp. 284–286. [10 refs.] [Hyg. Inst., Univ., Cologne.]

The author reports making cultures from a piece of leprous skin containing scanty lepra bacilli upon a tubercle bacillus malachite green-glycerine-egg medium, on which after 2 months at 37° C. a slight increase of the leprosy bacilli could be demonstrated. A sub-culture after 2½ months gave a greater increase of the organisms, but subsequently the second generation ceased to thrive and underwent slow degenerative changes.

L. R.

Muir (E.). **The Supposed Cultivation of the Organisms of Human and Rat Leprosy.**—*Jl. Preventive Med.* 1930. July. Vol. 4. No. 4. pp. 331–335. [2 refs.] [School of Trop. Med. & Hyg., Calcutta.]

Walker (Ernest Linwood). **Rejoinder.**—*Ibid.* pp. 335–336. [George Williams Hooper Foundation for Med. Research, Univ. of California, San Francisco.]

This paper is a criticism of two papers by Walker & Sweeney [this *Bulletin*, Vol. 26, p. 1032 ; 1040]. Information is asked regarding the precautions those authors took to avoid the errors of their predecessors in mistaking saprophytic skin diphtheroids, etc., for the leprosy bacillus through insufficient sterilization of the skin. A brief answer avoids answering this pertinent question by stating, "we consider ours (technique) was as adequate as is practicable."

L. R.

Hu (Ch'uan-ku'ei) & Mu (Jui-wu). **Demonstration of *Bacillus leprae* by Means of Cantharides Plaster and Carbon Dioxide Snow.**—*Nat. Med. Jl. China.* 1930. Apr.–June. Vol. 16. No. 2/3. pp. 177–181. [3 refs.] [Peiping Union Med. College, Peking.]

The authors describe a method of demonstrating lepra bacilli in skin lesions by the application over cutaneous lesions of cantharides plaster 0·5 cm. square, or the point of a stick of carbon dioxide snow for about one minute to produce blisters. These are opened after ten hours and the contents stained. Among 13 cases the first method gave positive results in 7 and the second in 9, against 9 and 10 respectively on examining the juice of the lesions or excised pieces. They think the blister method is of value when a patient objects to the other procedures.

L. R.

Morales-Otero (P.) & Hernandez (L. G.). **II. Studies of the Blood Chemistry of Leprosy. Analysis of Findings of Fifty Cases.**—*Porto Rico Jl. of Public Health & Trop. Med.* 1930. June. Vol. 5. No. 4. pp. 443–451. [14 refs.] [School of Trop. Med., Univ. of Porto Rico, San Juan.]

A study of the blood chemistry in fifty cases of leprosy showed very little, if any, variation in the concentration of serum calcium, blood chlorides, or phosphorus, regardless of the type, extent, or duration of the disease. Cholesterol was slightly reduced below the normal in leprosy, but in lepers treated by ethyl esters it was slightly higher than in untreated cases.

L. R.

Massias (Charles). Formule hémo-leucocytaire de la lèpre : éosinophilie dans la lèpre à lésions tégumentaires prédominantes. [**Leucocyte Formula in Leprosy. Eosinophilia in Skin Cases.**]—*C.R. Soc. Biol.* 1930. June 13. Vol. 104. No. 20. pp. 547–548.

The eosinophile leucocytes are moderately increased to 3 to 6 per cent. in early skin cases of leprosy, and to a greater extent, 13 to 18 per cent., in nodular cases, but they are normal or few in nerve cases. Mononuclear leucocytes are increased to a variable extent in the nodular lesions.

L. R.

Weidemann (M.). Zur Verteilung der Blutgruppen bei den Leprösen Lettlands. [**Blood Grouping in Lepers in Latvia.**]—*Med. Klin.* 1930. Aug. 1. Vol. 26. No. 31 (1338). p. 1155. [2 refs.] [Inst. of Forensic Med., Latvian Univ., Riga.]

Further work has confirmed the conclusions of Weidemann and Kaktin that there is no relationship between particular blood groups and increased leprosy incidence, but there appears to be some degree of increased susceptibility of certain races to the disease, as most cases come from areas of coastland inhabited by a particular stock.

L. R.

Tisseuil (J.). Sur l'origine de la lèpre en Nouvelle-Calédonie. [**Origin of Leprosy in New Caledonia.**]—*Bull. Soc. Path. Exot.* 1930. Apr. 9. Vol. 23. No. 4. pp. 357–363. [1 ref.] [Gaston Bourret Inst., Noumea, New Caledonia.]

This oft-told tale is recorded by quotations from previous reports.

L. R.

Tisseuil (J.). Camouflage des symptômes de lèpre par les indigènes. [**Concealment of Signs of Leprosy by Natives.**]—*Bull. Soc. Path. Exot.* 1930. June 11. Vol. 23. No. 6. pp. 574–576.

Natives know leprosy signs well, but they sometimes hide them by powdering their noses and facial skin lesions, or applying coal tar to their body, and they falsely attribute nerve lesions to scars they frequently suffer from.

L. R.

Brug (S. L.), Haga (J.), van Joost (R. P. A. C.) & Verbunt (J. A. M.). **Scabies crustosa s. Norvegica.**—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1930. June 1. Vol. 70. No. 6. pp. 576–587. With 5 figs. on 2 plates & 1 text fig. [14 refs.]

A Chinese of about 50, suffering from the anaesthetic type of leprosy, was also infected with scabies which showed in this case the typical picture of scabies crustosa. The patient died during a salicyl-sulphur cure, after an apparent preliminary success. The post-mortem examination confirmed the diagnosis. *Sarcoptes scabiei* was found (*in vivo*) in great abundance.

W. J. Bais.

i. Vigne (Paul). Lèpre maculeuse. Léprides folliculaires tuberculoides. Cas de contagion en France par lèpre importée. [**Follicular Tuberculoid Leprosy.**]—*Bull. Soc. Française Dermat. et Syph.* 1930. May. No. 5. pp. 596–606. With 5 text figs. [1 ref.]

ii. Messimy (R.). A propos de quelques cas de lèpre, observés au Maroc, dans la région de Marrakech. [**Leprosy in Morocco.**]—*Bull. Soc. Path. Exot.* 1930. June 11. Vol. 23. No. 6. pp. 600–618. With 2 text figs. [4 refs.]

i. An account of a case of the follicular tuberculoid type of leprosy with an illustration of the tubercle-like lesions found microscopically.

ii. A brief account of some cases of leprosy seen in Morocco.

L. R.

Cochrane (R. G.). **Classification and Routine Treatment of Leprosy.**—*Kenya & East African Med. Jl.* 1930. July. Vol. 7. No. 4. pp. 100–107. With 1 text fig.

A brief account of the generally used methods of treatment.

L. R.

Labernadie (V.) & Srinivassane. Bons effets de l'huile d'Hydnocarpus Wightiana dans le traitement de la lèpre. [**Good Effects of Hydnocarpus Oil in Treatment of Leprosy.**]—*Ann. de Méd. et de Pharm. Colon.* 1930. Jan.–Feb.–Mar. Vol. 28. No. 1. pp. 62–69. [1 ref.]

The authors report favourable results in 150 cases of leprosy from injections of *H. wightiana* oil prepared at Pondichéry on the lines of Muir's work in Calcutta; notes of some of the cases are recorded.

L. R.

Aubin (H.). Essai de traitement de la lèpre par les sels d'or. [**Treatment of Leprosy by Gold Salts.**]—*Bull. Soc. Path. Exot.* 1930. July 9. Vol. 23. No. 7. pp. 693–696.

This is a short paper indicating some benefit from injections of gold preparations in leprosy.

L. R.

TROPICAL OPHTHALMOLOGY:

A REVIEW OF RECENT ARTICLES.—XIV.*

EYELIDS.—CRUICKSHANK[1] describes a successful operation for the relief of *symblepharon*. The band of tissue stretched from the inner canthus to an attachment on the cornea and interfered with the movements of the lids and eyeball. The band was dissected from the underlying tissues and bisected horizontally. A mucous membrane graft, 22 mm. by 10 mm., taken from the lip, was then stitched in place over the bare area, whilst the band was utilized to deepen the fornices. The writer stresses the importance of making the graft as thin as possible. This is effected by laying it raw surface upwards on the pulp of the left forefinger and removing all fat, etc., with fine scissors.

CONJUNCTIVA.—CHESNEAU[2] finds that diseases of the eye account for 10 per cent. of outpatient consultations in Cammon. Diplo-bacillary infections are the most numerous (41 per cent.), whilst Koch-Weeks inflammations amount to 29 per cent. These diseases are unaccompanied by serious complications. Laos was free from trachoma until it became infected by Annamite immigrants. (The author reaffirms this statement in another paper.[3]) There is some extension of the disease in districts where the inhabitants are in contact with these Annamites. From March to June is the season in which these conjunctival troubles are particularly rife. The statistics show comparatively little gonorrhoeal ophthalmia (2 per cent.); but the author points out that this is deceptive since the figures only deal with the milder forms of disease, such as are easily treated in the outpatient department. MULDOON[4] has reviewed the diseases of the eye met with in Honduras. Acute catarrhal conjunctivitis is the principal cause of disability, the Koch-Weeks being the most common causative organism. Only five cases of trachoma were treated; the disease is seldom seen except among Syrian immigrants. Of 438 patients, 57 suffered from pterygium and 6 from detachment of the retina.

CLOITRE[5] has found Koch-Weeks catarrh to be the commonest conjunctival affection in South Madagascar. Morax-Axenfeld infections are fewer, whilst trachoma is very rare. He has recently observed a form of follicular conjunctivitis in five patients. In one of these the follicles were distributed over the conjunctiva of both lids, the globe and the plica semilunaris. The elevations tended to be arranged in regular lines and pannus was absent. The follicles were composed of varying sized clusters of lymphocytes in a fine fibrillar

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* For the thirteenth of this series see Vol. 27, pp. 501–507.

1 CRUICKSHANK (M. M.). Restoration of the Conjunctival Cul-de-Sac in a Case of Extensive Posterior Symblepharon.—*Indian Med. Gaz.* 1930. July. Vol. 65. No. 7. pp. 392–393. With 1 text fig.

2 CHESNEAU (Pierre). Les conjonctivites infectieuses au Cammon, Province du Moyen-Laos.—*Bull. Soc. Méd.-Chirurg. Indochine.* 1929. Oct. Vol. 7. No. 10. pp. 514–522. With 2 charts.

3 CHESNEAU (Pierre). La trachome au Cammon (province du Moyen-Laos).—*Bull. Soc. Méd.-Chirurg. Indochine.* 1930. May. Vol. 8. No. 5. pp. 396–405. With 1 map & 1 graph in text.

4 MULDOON (W. E.). Diseases of the Eye in Honduras.—*Eighteenth Ann. Rep. Med. Dept. United Fruit Company, Boston, Mass.* 1929. pp. 264–271.

5 CLOITRE (J.). Note sur une cause de cécité assez fréquement observée chez les Malgaches.—*Bull. Soc. Path. Exot.* 1930. Feb. 12. Vol. 23. No. 2. pp. 254–255.

network. The patients complained of slight photophobia and a sensation of a foreign body in the eye ; a low degree of conjunctival hyperaemia was present. The trouble lasted for twelve or fifteen months, and was but little affected by any treatment.

Trachoma.—In view of the rather differing opinions regarding the specific nature in trachoma of the organism described by NOGUCHI as *Bact. granulosis*, the findings of LUMBROSO[6] are interesting. He states that he succeeded in isolating a similar micro-organism from five out of seven cases of untreated trachoma in Tunis. Inoculation of the culture produced granular conjunctival changes in a previously healthy baboon. Lumbroso considers that his investigations, though not convincing, are in favour of Noguchi's claims. TANG[7], however, has attempted to cultivate the bacillus from material obtained from 25 cases of typical trachoma, and was only once able to isolate an organism like that described ; even this one was atypical and failed to cause any lesion when inoculated on rabbits and monkeys. LABERNADIE and GOVINDARAJASSAMY[8] report a very favourable experience of chaulmoogra oil as a local application. The affected membrane is scrubbed with absorbent wool which has been mounted on a glass rod and thoroughly saturated with the drug. Sufficient force is used to rub the follicles from the conjunctiva. This grattage is repeated daily for a week or so. [It does not seem easy to estimate how much credit for a good result should be assigned to the chaulmoogra oil and how much to the grattage.] AYUYAO[9] has found tattooing of the conjunctiva with 25 per cent. solution of acetic acid successful in treating the disease amongst the Filipinos. He uses a solution of acetic acid 25 per cent., sodium bicarbonate 2 per cent., and cocaine 5 to 10 per cent. The conjunctiva is washed and anaesthetized and all the follicles are then pricked with a tattooing needle dipped in the solution. During the proceeding an assistant continuously drops a solution of bicarbonate of soda into the eye in order to protect the cornea against the action of the acid. The author has never encountered a severe case of the disease in the Philippines, and the follicular type is practically the only one seen. RAGAIN[10] eulogizes the use of diathermy in the treatment of trachoma. He employs fulguration and makes very short applications of one-fifth of a second. Some transitory pain is experienced, and a rather marked local reaction, which subsides in two or three days, occurs. A superficial eschar is produced and this separates about the third day. Cicatrization is completed by the

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6 LUMBROSO (Ugo). Nouvelles recherches sur l'étiologie du trachome. Etude d'un germe, rencontré en Tunisie, dans ses rapports avec le *Bacterium granulosum* de Noguchi.—*C.R. Acad. Sci.* 1930. Apr. 28. Vol. 190. No. 17. pp. 1026–1028.

7 TANG (F. F.). An Attempt to isolate *Bacterium granulosis* Noguchi from Cases of Trachoma.—*Nat. Med. Jl. China.* 1930. Feb. Vol. 16. No. 1. pp. 68–74. [6 refs.] [Med. College, National Central Univ., Woosung, Shanghai.]

8 LABERNADIE (V.) & GOVINDARADJASSAMY. Utilisation de l'huile d' "Hydnocarpus Wightiana" pour le traitement du trachome.—*Ann. de Méd. et de Pharm. Colon.* 1930. Jan.–Feb.–Mar. Vol. 28. No. 1. pp. 69–71. [1 ref.]

9 AYUYAO (Conrado D.). Acetic Acid in the Treatment of Trachoma.—*Jl. Philippine Islands Med. Assoc.* 1930. Mar. Vol. 10. No. 3. pp. 129–131. [1 ref.] [Med. College, Univ. of the Philippines, Manila.]

10 RAGAIN. Traitement du trachome par étincelage de tension (fulguratio monopolaire).—*Bull. Soc. Méd.-Chirurg. Indochine.* 1930. May. Vol. 8. No. 5. pp. 419–433.

twelfth day, and, if any trachomatous areas persist, the treatment may then be repeated. Pannus is specially benefited. Other forms of local and constitutional treatment should also be employed.

The numbers of the *Revue du Trachome* for January, April and July, 1930, prove the serious attention now devoted to trachoma in France and in the French colonies. NICOLLE[11] states his conviction that all kinds of monkeys other than the Algerian baboon (*Macacus innuus*) are unsuitable for inoculation experiments owing to their liability to contract a granular form of conjunctival inflammation after a simple scarification of the conjunctiva. MORAX[12] concludes that the *Bact. granulosis* described by Noguchi does not appear to be the causative organism in trachoma. AUBARET[13] admits that many cases of spontaneous cure may occur in districts where the disease is rife, but does not regard this as constituting a reason for any diminution in active measures against trachoma in such places. ZACHERT[14] describes the steps taken in Poland to combat the disease. Thanks to these measures the number affected is much diminished and there is ground for hoping that the scourge may in time disappear from the country. TRAPESONTZEWA[15] states her conviction that trachoma may be contracted in adult life and not in childhood only. [To English surgeons this assertion seems unnecessary.] The same observer[16] inoculated six human subjects with filtered material obtained from many different patients suffering from undoubted trachoma. In no case did the filtered virus give rise to more than a mild transient inflammation. She therefore concludes that the cause of trachoma is a non-filtering virus. TALBOT[17] argues that trachoma was introduced into Italy in the thirteenth century by the Crusaders. St. Francis of Assisi was a prominent sufferer from the disease. SÉDAN[18] records three instances in which the instillation of eserine for glaucoma appeared to cause a recrudescence of trachoma in patients whose conjunctival disease was previously quiescent. He recognizes the fact that eserine is capable of lighting up a follicular inflammation, but regards these cases as being true trachoma. The periodicals also contain many papers which record the incidence of the disease in the French colonies.

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11 NICOLLE (Charles). Sur les conjonctivites naturelles (granuleuses et folliculaires) des singes inférieurs et leur non identité avec le trachome.—*Rev. Internat. du Trachome.* 1930. Jan. Vol. 7. No. 1. pp. 1–2.

12 MORAX (V.). Le bactérium granulosis et le trachome.—*Rev. Internat. du Trachome.* 1930. Jan. Vol. 7. No. 1. pp. 2–6.

13 AUBARET. Notes sur les cas d'amélioration et de guérison spontanées du trachome.—*Rev. Internat. du Trachome.* 1930. Jan. Vol. 7. No. 1. pp. 6–12.

14 ZACHERT (M.). L'organisation de la lutte contre le trachome en Pologne.—*Rev. Internat. du Trachome.* 1930. Jan. Vol. 7. No. 1. pp. 19–23. [4 refs.]

15 TRAPESONTZEWA (C.). De la contamination de l'adulte. (Réponse à M. Canis.)—*Rev. Internat. du Trachome.* 1930. Jan. Vol. 7. No. 1. pp. 23–28.

16 TRAPESONTZEWA (C.). Le virus du trachome, est-il un virus filtrant?—*Rev. Internat. du Trachome.* 1930. Apr. Vol. 7. No. 2. pp. 65–71.

17 TALBOT. Trachome importé d'Egypte en Italie dès le XIIIe siècle.—*Rev. Internat. du Trachome.* 1930. Apr. Vol. 7. No. 2. pp. 112–114. [1 ref.]

18 SÉDAN (Jean). Réveils trachomateux d'origine ésérinique.—*Rev. Internat. du Trachome.* 1930. July. Vol. 7. No. 3. pp. 152–155.

Cornea.—*Superficial Punctate Keratitis.*—Wright[19] has recorded his observations on superficial punctate keratitis in a paper which he submitted to the 13th International Congress of Ophthalmology. Various epidemics of the disease have been reported from time to time in Bombay and Madras. In 1928 and in the beginning of 1929 the disease became very rife in Southern India and 923 cases were treated at the Madras Government Ophthalmic Hospital. [Superficial punctate keratitis is somewhat a misnomer, since in a very large number of cases the most noticeable lesion lies in the substantia propria of the cornea and is of considerable size.] Even in the mildest types of the disease there was nearly always to be found some trace of deposit on the endothelium of Descemet's membrane; and the deep layer of the cornea sometimes showed folding with large pigmented deposits. Wright was often able to observe a preliminary stage of slight conjunctival hyperaemia. This, in rare cases, became extreme and was associated with oedema of the lids and chemosis. The author was able to reproduce the disease by the direct inoculation of unfiltered suspension of infected epithelium in three out of seven human subjects, and by the inoculation of a filtered suspension in five out of eleven. The average patient improved rapidly when the eye was kept covered with a moist boric pad under an eye shade, or bandage, and treated with dionine drops twice daily and atropine ointment at night. The most prolonged lesions were seen in patients who had not kept the eye occluded from the commencement of the attack. The prognosis may be regarded as being very good.

Uvea.—Cloitre[20] notes that a chronic type of syphilitic iritis is common in Madagascar. The acute form of the disease is remarkably rare; but this chronic and insidious variety is fairly common. It takes two or three years to run its course and ends in occlusion of the pupil. It is often mistaken for cataract by those who are unskilled.

Lens.—*Cataract.*—Cargill's[21] paper on the treatment of incipient cataract contains much that will prove useful to surgeons working in the Tropics, though he mainly considers the subject from the European standpoint. He mentions, without much enthusiasm, various forms of local treatment, and discusses the more valuable method of searching for a constitutional defect likely to influence lens nutrition and directing treatment towards this. Endocrine deficiency, especially hypothyroidism, may be a factor and it is of the highest importance to eliminate chronic toxaemias. Teeth, tonsils, sinuses, the gastro-intestinal and genito-urinary tracts should all be passed in review. He wisely insists that a patient suffering from early but slowly progressive opacities of the lens should never be subjected to the shock of the bald statement that he has "cataract." A cheerful optimism should be cultivated, and it is sufficient to tell him that he has some "flaws" in his lens. Anklesaria[22] advocates the use of a bridge-flap in cataract extraction. He

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19 Wright (R. E.) et al. Superficial Punctate Keratitis.—*Brit. Jl. Ophthalm.* 1930. June. Vol. 14. No. 6. pp. 257–291. With 1 text fig.

20 Cloitre (J.). Note sur la conjonctivite folliculaire dans le sud de Madagascar. —*Bull. Soc. Path. Exot.* 1930. Feb. 12. Vol. 23. No. 2. pp. 255–256. [Fianarantsoa Hosp., Fianarantsoa.]

21 Cargill (L. Vernon). The Management and Treatment of Incipient Cataract. —*Brit. Med. Jl.* 1930. Sept. 13. pp. 419–421. [12 refs.]

22 Anklesaria (M. D.). Some Safeguards and Points of Technique in the Extraction of Senile Cataract with Capsulotomy.—*Indian Med. Gaz.* 1930. Feb. Vol. 65. No. 2. pp. 67–71.

considers that the flap may render delivery of the lens a little more difficult, but the bridge should be of a good length. It is highly important, too, to make the section sufficiently large. He finds that bleeding from the flap can be controlled by the addition of adrenaline to the cocaine. Capsulotomy is performed with forceps and delivery of the nucleus is aided by impaling it upon the point of the knife. Cortical remnants are irrigated from the chamber. Any constitutional defect is treated before operation is undertaken and all local sepsis is eliminated. Herbert's method of perchloride of mercury irrigation is employed, and orbicular paresis is induced by Van Lint's technique.

Glaucoma.—Ferguson[23] states that in Nigeria glaucoma attacks Africans at a comparatively early age. He remarks that the patients practically always have a history of untreated yaws. The disease is usually of a chronic type, but subacute exacerbations also occur. Wadia[24] reports a case of recovery of vision in an eye which had been blind from glaucoma for eight months. He performed a successful trephining operation. The patient was a woman aged 49, and the glaucoma had developed after an attack of "beriberi." [The reviewer, when in Madras, found it worth while to trephine blind patients if they had been able to find their way about without guidance three months previously.]

Herbert[25] argues that iridencleisis, or iris-inclusion, is the best operative treatment for glaucoma. He modifies the ordinary operation by causing a small irido-dialysis, tearing a small portion of the iris from its attachment, and claims that this procedure induces a localized development of fibrous tissue in the conjunctiva covering the iris prolapse. This new-formed fibrous tissue acts as a shield, yet it does not interfere with efficient drainage of the aqueous into the surrounding sub-conjunctival tissue. He describes his technique as follows :—

"The edge of the ordinary pattern bent keratome (small blade preferred) pushes the conjunctiva from a point 6–7 mm. from the corneal margin down nearly to the corneal margin, the exact point depending on the varying degree of overlapping of the cornea by the conjunctival limbus. The knife point is pushed on into the anterior chamber, at first inclined somewhat towards the iris, very slowly and preferably with side-to-side movements, till the exact size wanted at the deep surface of the cornea is judged to have been produced. The ordinary pattern of bent iris forceps is easily introduced through the subconjunctival passage and so into the chamber. The points of very fine forceps are apt to be caught repeatedly in the conjunctival tissue. The iris is well gripped and pulled slowly towards the centre of the pupil, till it is seen to have been torn from its base locally. There is no bleeding from the torn iris. It is then drawn through the sclero-corneal wound, to be cut radially under the conjunctiva. Straight iris scissors are the more convenient for this. If de Wecker's scissors are used, short-bladed ones are the best. Repeated snips are made because the effect cannot be seen sufficiently, often being hidden by blood or uveal pigment under the conjunctiva. It is not quite essential that the cut should reach the pupillary border, though this is aimed at. The iris is not released from the grip of the forceps until the cutting is completed."

The author recognizes that sympathetic ophthalmitis may follow an operation in which the uvea remains prolapsed. But he claims to

23 Ferguson (H. R. M.). Primary Chronic Glaucoma as met with at Port Harcourt, Nigeria.—*West African Med. Jl.* Lagos. 1930. Jan. Vol. 3. No. 3. p. 59.

24 Wadia (B. K.). Recovery of Sight in a Blind Glaucoma Case.—*Calcutta Med. Jl.* 1930. Aug. Vol. 25. No. 2. pp. 82–84.

25 Herbert (H.). The Future of Iris-Inclusion in Glaucoma.—*Brit. Jl. Ophthalm.* 1930. Sept. Vol. 14. No. 9. pp. 433–448.

have eliminated this danger by careful preliminary disinfection of the conjunctiva. He uses his well-known irrigation of 1–3000 perchloride of mercury lotion. This is carried out for at least two minutes, and should be completed a full twenty minutes before the commencement of the operation. A secretion of mucus from the surface of the membrane is the sign that the irrigation has been sufficient. All minor precautions against infection are also adopted. Meiotics are omitted for sixteen hours before operation as it is desirable that the pupil should be dilated when operating; adrenaline instillations are usually effective in securing this dilatation.

Retina.—*Detachment of the Retina.*—Retinal detachment is one of the greatest tragedies encountered by the ophthalmologist, and Ormond[26] has performed a valuable service in rendering recent views and information on the subject easily accessible to the practitioner. He has placed on record the theories advanced by Gonin and the treatment adopted by that surgeon. This observer believes that detachment of the retina only occurs if a tear or hole exists in the membrane, and that this hole allows the liquid vitreous to pass through it and so raise the retina from its bed on the pigment epithelium. In recent cases such tears are usually situated on the convexity of the detachment, but later, when the fluid alters its position, they may be found at other parts. The region of the ora serrata, owing to the thinness of the retinal layer in that area, is a favourite site. When placed posterior to the equator holes are more often the result of previous pathological changes or of trauma. Treatment is directed to the closure of the retinal hole. This is effected by incising the sclera over the hole and introducing a glowing cautery after allowing the subretinal fluid to escape. It is essential to locate accurately the hole and to operate in such a way as to insure its closure. Gonin furnishes minute directions as to how this may be best effected.

General Diseases. *Leprosy.*—Hoffmann[27] enthusiastically recommends the use of gold salts in the treatment of ocular leprosy. He has used krysolgan and solganol in particular. The preparation can be injected intravenously or subcutaneously. Increasing doses are given in a series of eight injections, one every five to eight days.

Sparganosis.—The irritating and dangerous character of many of the eye remedies used by vaidyans and quacks in tropical countries is painfully familiar; but one would regard the use of portions of a dismembered frog as an application to the eye as being comparatively innocuous. Motais[28] has, however, found that the treatment is a frequent cause of sparganosis in Indo-China. The predilection of the parasites for the malar and orbital regions is explained by the practice.

The Annual Report of the Madras Ophthalmic Hospital[29] is, as usual, interesting reading. Senile cataract accounted for 1,612 of the

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[26] Ormond (Arthur W.). Spontaneous Detachment of the Retina.—*Brit. Med. Jl.* 1930. May 24. pp. 940–941. [1 ref.]

[27] Hoffmann (W. H.). Gold Treatment of Eye Affections in Leprosy.—*Jl. Trop. Med. & Hyg.* 1930. Aug. 15. Vol. 33. No. 16. pp. 233–236. [Finlay Inst., Havana, Cuba.]

[28] Motais (F.). Considération sur la pathogénie de la sparganose oculaire.—*Bull. Soc. Méd.-Chirurg. Indochine.* 1929. July. Vol. 7. No. 7. pp. 363–368.

[29] Madras. Administration Report, Statistics and Professional Report of the Govt. Ophthalmic Hospital, Madras, for 1929 [Wright (R. E.)].—43 pp. With 1 chart & 6 figs. on 2 plates. 1930. Madras. Govt. Press. [1 rupee, 8 annas.]

3,152 operations performed upon in-patients. The " bridge-flap " has now been adopted with satisfactory results. Barraquer's operation is reserved for uncomplicated immature cataracts. O'Brien's method of inducing seventh nerve paresis by the injection of novocaine and adrenaline in the neighbourhood of the mandibular joint is now employed. WRIGHT observes that " when the cataract has been extracted and the lips of the section are lying in apposition, actual movements of the recti muscles do not appear to have as much influence as one might suppose in causing the section to gape under the thrust of the contents of the posterior segment. It is the sudden initiation of such movement that appears to cause the section to gape." (The most important factor in the production of such gaping and consequent vitreous loss is probably a contraction of the orbicularis, which, when the eyelids are fixed by a speculum, drags the levator palpebrae forward and causes the belly of that muscle to press upon the deep portion of the globe.) Remarks regarding the epidemic of superficial punctate keratitis (already referred to in this article) occupy some pages of the report. The epidemic was a very considerable one and accounted for nearly 3,000 admissions to the outpatient department. Amongst the interesting cases recorded is that of a man aged 25 who developed quinine amblyopia as the result of quinine administered in medicinal doses for a long-standing benign tertian infection. Treatment was a difficult problem as the patient was cachectic and suffering severely from malaria. General constitutional treatment, however, so improved his condition that he was able to tolerate intravenous injections of quinine without ocular damage and eventually to become free from parasites. On leaving hospital he had good central vision but a marked contraction of his visual fields. It is reaffirmed that keratomalacia may possibly be considered to be the most serious cause of preventable blindness amongst children in Madras, and it is in any case a more serious one than ophthalmia neonatorum. Radium was used in the treatment of various conditions. Round cell sarcoma, chloroma, and lymphoblastoma responded well, as also did rhinosporidium ; but spring catarrh did not benefit, whilst trachoma appeared to be rendered worse.

H. Kirkpatrick.

SPRUE.

MANSON-BAHR (Philip) & WILLOUGHBY (Hugh). **Studies on Sprue with Special Reference to Treatment. Based upon an Analysis of 200 Cases.**—Reprinted from *Quarterly Jl. Med.* 1930. July. Vol. 23. No. 92. pp. 411–442. With 9 figs. (7 on 3 plates) & 5 graphs. [18 refs.] [Hosp. for Trop. Diseases, London.]

The authors analyse 200 cases of sprue observed by one or other over a period of ten years. They note the rarity of cases outside India, China and Ceylon, but mention one from Nyasaland and another from Mauritius. [Cases do occur elsewhere, but apparently they have not come within the authors' purview.] Stress is duly laid on the fact that many patients suffer for years from manifestations of sprue without their true import being recognized, and also that there may be a latent period of 6 to 8 years' residence in Europe before the onset of recognizable symptoms. [In view of these two propositions it is not quite clear what the authors mean by the statement " Sprue has a definite incubation period."] An analysis of special symptoms, largely from the clinical aspect, is presented, including the physical signs in the abdomen, the blood changes, the presence of cramps and tetany, the occasional pyrexia and the invariable emaciation. The major part is devoted to treatment ; the various changes of treatment which have been in vogue during the last 20 years are reviewed, from the plain milk of Sir Patrick MANSON'S day giving place to the Salisbury diet ; the Begg treatment by santonin, which to be effectual must itself have undertaken the journey to a sprue country ; next the strawberry and fruit cure, through papaw and raw meat to the more modern liver soups and extracts, calcium and parathyroid, blood transfusion and high protein.

From the medicinal aspect the general use of calcium is noted, in the form of Pulv. Bataviae Co., Peter Sys's powder, kaolin, etc., and the use of dilute HCl if there is hypochlorhydria. The combination with parathyroid preparations for regulating the calcium metabolism was tried by the authors in 137 cases. Though they have " seen no deleterious effects attributable to this form of treatment " they state that after its use " more than one relapse of acute symptoms occurred. In one instance it did not prevent a fatal issue to the disease, and we have had experience of some six cases where clinical improvement took place immediately the calcium lactate and parathyroid *ceased* to be given " (p. 436). The fatality of the whole series was only 1·5 per cent. The differential diagnosis from chronic pancreatitis, Addisonian anaemia, coeliac disease, and stomatitis of streptococcal origin is briefly discussed, and the paper closes with advice on after-treatment and care in sprue cases. Appended to the letterpress are three plates of photographs showing the glazed condition of the tongue, the abdominal tumidity from meteorism, the pigmentation which may accompany the anaemia, and the marked emaciation.

[With a fatality rate as low as 1·5 per cent. throughout a series of 200 cases of a disease hitherto regarded as of the utmost gravity, it is naturally difficult to assess the value of these various forms of treatment. Each has had its advocates and each has apparently been successful

in its turn, perhaps because, as the authors state, most sprue patients are " of the intelligent and impressionable type " with idiosyncrasies. Their experience with calcium and parathyroid has been surprisingly at variance with that of other physicians both at home and abroad in Ceylon, India, Straits Settlements and South China. Several explanations may be offered for the failure of this form of treatment in the authors' cases ; thus, there may be more than one form or variety of sprue, one amenable to calcium and parathyroid, another not, their patients having been of the latter category, or again they may have been unfortunate in having been supplied with an inert preparation of the gland, for there is no doubt that these are not stable under all conditions of age and climate.]

H. H. S.

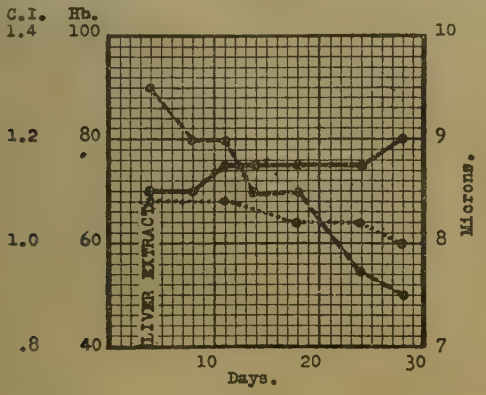
FAIRLEY (N. Hamilton). **Sprue. Its Applied Pathology, Biochemistry and Treatment.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. Aug. 8. Vol. 24. No. 2. pp. 131–179. With 7 graphs in text. [3 pages of refs.]

Dr. Fairley's paper, though reviewing the subject of sprue generally, is concerned largely with the biochemical aspect and his personal researches in this connexion. The blood changes are described in detail and the results of chemical examination of the blood and serum—the blood cholesterol, serum bilirubin and content of calcium and phosphorus. The anaemia was of the megalocytic type (as had been previously shown), the cholesterol content was low, the two extremes being 40 and 102 mgm. per 100 cc. in place of the normal 100–220 mgm. The author, in conjunction with MACKIE, had previously confirmed the reduction of ionic calcium and further figures relating to the total calcium are presented in this paper ; the phosphorus content differed little, if at all, from the normal. The author also records the results of his analyses of the gastric contents and of the faeces. The former showed a decrease in the HCl, but rarely actual achlorhydria.

As a result of these investigations the author has proposed a scheme of " rational therapeutics " of the disease. The essential principles of the form of treatment advocated are : alimentary rest, restoration of the blood, and the reinforcing of demonstrable deficiencies. The first is attained by giving a diet of high protein content with low fat, low carbohydrate and adequate vitamin, for starchy food and the disaccharides give rise to acid fermentation and fat is poorly absorbed. The blood restoration is brought about by liver extract, aided at times by 6–12 units of insulin daily and the use of glucose. The effects of this treatment on the weight and on the blood are well shown in the accompanying graphs, which are merely examples of several depicted in the full paper.

The third principle—the reinforcing of demonstrable deficiencies—is largely met by symptomatic treatment, the exhibition of HCl where this is low, similarly as regards calcium, while the low fat diet is of much assistance in promoting the same ends. Five standard diets of graded caloric value are given in an appendix. [The author mentions that the parathyroid gland in three cases of sprue showing decrease in ionic calcium revealed no abnormality on microscopical examination. This

is what would be expected seeing that patients who react to treatment with preparations of these glands improve so rapidly that any disturbance present is almost certainly of a functional nature, and this is supported by the fact that after 3 weeks or so the patient's own glands



Hæmoglobin ——— Diameter .....
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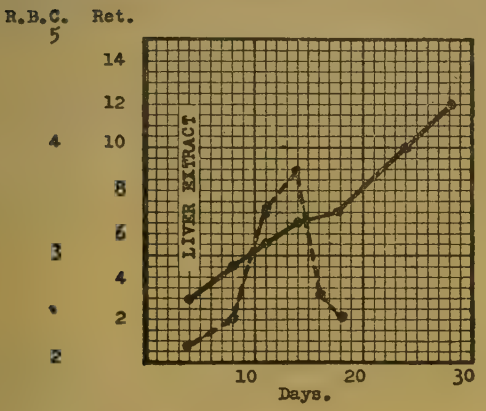
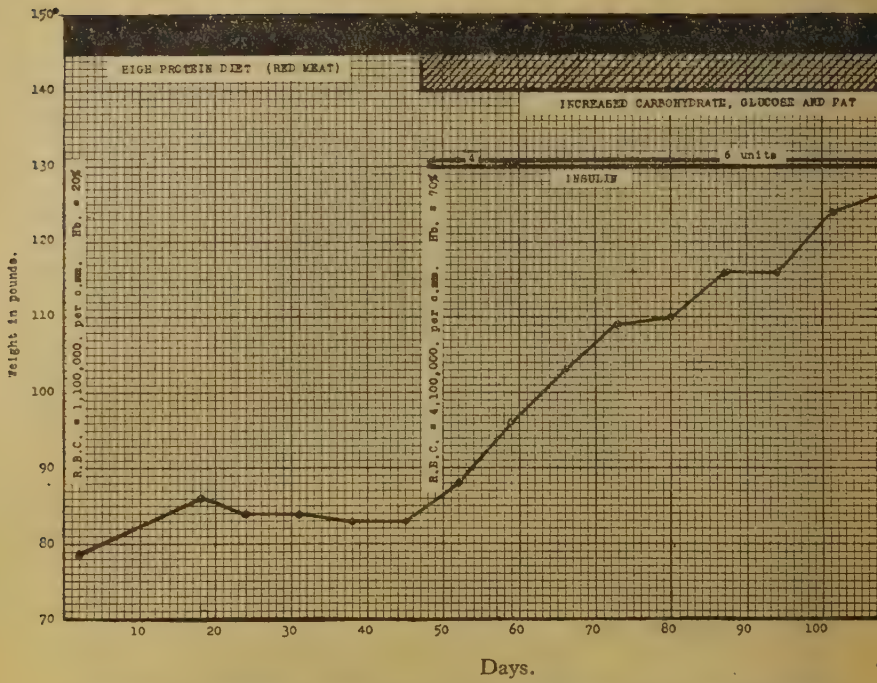


Red Blood Corpuscles ———
Reticulocytes - - - - - -

Effects of liver extract and high protein diet on the blood in sprue (*Case No. 8*). Normal acid curve marked response to histamine. Tetany: cramps: hour glass stomach present.

[Reproduced from *Transactions of the Royal Society of Tropical Medicine and Hygiene*.]

have sufficiently recovered to carry on their duties unaided. The paper is a most instructive one, and no true justice can be done to Dr. Fairley's work in a summary; the original must be studied. The deductions drawn, though at present largely theoretical, appear to



Weight curve of sprue patient (*Case No.* 9) illustrating effect of a 47 day alimentary rest on high-protein, low-fat, low-carbohydrate diet followed by a higher calorie diet supplemented by 6 units of insulin daily with glucose *per os*.

[Reproduced from *Transactions of the Royal Society of Tropical Medicine and Hygiene*.]

rest on a basis of sound pathological, haematological and chemical findings, and it is to be hoped that the newest form of treatment may meet with a better fate than its predecessors.]

H. H. S.

PORTER (William B.) & RUCKER (J. E.). **The Treatment of Nontropical Sprue with Liver Extract. A Report of Two Cases.**—*Amer. Jl. Med. Sci.* 1930. Mar. Vol. 179. No. 3 (696). pp. 310–316. With 2 charts in text & 2 figs. on 1 plate. [11 refs.] [Med. College of Virginia, Richmond.]

In a recent study of 45 patients having the macrocytic type of anaemia two patients were found to present clinical phenomena and laboratory data so distinctive that they could be classified as replicas of each other.

The cardinal features of the disease were the extreme degree of emaciation, severe anaemia of macrocytic type, chronic diarrhoea, normal amounts of hydrochloric acid in the gastric content, complete absence of neurological phenomena, rapid and consistent improvement following the feeding of adequate amounts of potent liver extract.

In the treatment of the two cases a general hospital diet was given with the addition of an aqueous extract of liver prepared in the Department of Medicine and Biochemistry of the Medical College of Virginia in amounts equivalent to 630 gm. of raw liver per diem.

In neither case was Ashford's monilia demonstrated nor did the patients present the characteristic "fatty" stools at the time of admission to hospital. The diagnosis of non-tropical sprue instead of pernicious anaemia was favoured because of the normal hydrochloric content of the gastric juice, the absence of neurological findings and the marked degree of emaciation. The finding of adequate amounts of hydrochloric acid in patients who have blood pictures of an advanced macrocytic anaemia strongly suggests that the megaloblastic anaemias may be dependent upon an independent factor; therefore adequate amounts of hydrochloric acid should be administered as a routine in the treatment of patients with a primary anaemia, regardless of how completely the blood has been restored to normal by liver feeding.

P. H. Manson-Bahr.

CASTELLANI (Aldo). **Brief Notes on the Administration of Liver, Pancreas and Stomach Extracts in Sprue.**—*Jl. Trop. Med. & Hyg.* 1930. May 1. Vol. 33. No. 9. p. 126. [2 refs.]

Castellani has been using liver in the treatment of sprue, although the results obtained are not so brilliant as those in pernicious anaemia. In 1925 he advocated raw pancreas, but patients usually greatly object to the taste. In two recent cases of sprue of medium severity with anaemia he has given stomach extract, called "ventriculin" and first prepared by E. A. Sharp, C. C. Sturgis and R. Isaacs, and now placed on the market by Parke, Davis and Co. It is claimed that this substance is more effective in stimulating reticulocytosis, more stable and more palatable than liver extracts. The preliminary investigations in sprue seem to Castellani favourable.

P. H. M-B.

HANCE (J. B.). **Notes on the Pathogenesis of Sprue and the Asthenic Diarrhoea of Indians. With Special Reference to the Rôle played therein by Amoebiasis. The Probable Identity of the Two Former Conditions, and their Connection with Addisonian Anaemia—Subacute Combined Degeneration of the Cord—Hunterian Glossitis Syndrome of Hurst.**—*Indian Med. Gaz.* 1930. Mar. Vol. 65. No. 3. pp. 125–130. With 1 text fig. [8 refs.]

In Kathiawar, asthenic and sprue-like diarrhoea appear to be so prevalent as almost to deserve the description of endemic. An analysis of 26 consecutive cases has been made. In some diarrhoea, in others anaemia has dominated the clinical picture, and in three the main symptoms have been nervous. Hance suggests that it is usually caused by the coexistence of intestinal ulceration and infection with a haemolytic streptococcus. The evidence he has collected goes to show that *E. histolytica* is usually the primary culpable agent, since in 15 out of the 26 cases cysts of this organism were found. Only two cases gave a positive agglutination to *Bact. dysenteriae*. Hance believes that the

streptococcus is the " ulcerating organism." The average age of the series of patients is 36, the oldest being 55, the youngest 19. Twenty-three were males and three females. Only one European figured in this series, Hindus were twice as often affected as Mahommedans, and this has further the significance that vegetarians are affected twice as often as non-vegetarians.

As regards the anaemia, the diagnosis must rest not upon the colour index, but upon the nature of the red blood cells observed. Poikilocytosis and anisocytosis are common—myelocytes invariable. Five of the present series showed paraesthesiae of the extremities comparable with early subacute combined degeneration of the cord.

P. H. M-B.

Ashford (Bailey K.). **Suggestions for a Rapid Classification of the Anemias of Sprue and Nutritional Unbalance in the Tropics.**—*Porto Rico Jl. Public Health & Trop. Med.* 1929. Dec. Vol. 5. No. 2. pp. 167–184. [School of Trop. Med., Univ. of Porto Rico, San Juan.]

The purpose of this paper is to suggest a brief method of arriving at fairly reliable diagnosis and treatment of the anaemias accompanying nutritional unbalance of the tropics and its common sequela—sprue. All persons suffering from clinical sprue or its preceding nutritional unbalance have had their haemoglobin percentage estimated by the Dare instrument. In all cases with an haemoglobin percentage of less than 70 per cent. a red and white cell count has been performed. All cases coming under the latter category with a colour index of plus 1 or over, and with haemoglobin below 50 per cent., have in addition had a differential count of leucocytes and a careful measurement of ten erythrocytes in a field performed. This should always be supplemented by a count of the reticulocytes, which in cases presenting a picture of the pernicious type of anaemia should be made four, seven and ten days after the first administration of liver extract in order to catch, at least, the up or down curve of the reticulocyte peak.

Those cases which do not respond to liver extract after two weeks of administration may be suspected of being hypoplastic and this expensive remedy should be stopped. One should not be satisfied with one Price-Jones curve, but make not less than one such curve a week. The reduction in anisocytosis is thus more sharply defined and the return to a normal mean gives a more convincing proof of approaching recovery ; it will be necessary to measure one hundred cells each time.

It is reprehensible to withhold liver or an extract of it from a case of true pernicious anaemia, nor is it advisable to administer iron to a liver already choked with it. Liver extract should not be administered as a routine to cases of secondary anaemia or most of all in a case of haemoglobinaemia. There are two striking differences between the pernicious anaemia of Addison seen in the temperate zone and the pernicious anaemia of sprue : in only three of the forty-two cases of sprue anaemia were normoblasts or megaloblasts seen, and then only extremely few. The reticulocytosis following the administration of liver extract is usually feeble compared to the vigorous rise of the curve apparently the rule in Northern countries.

P. H. M-B.

ASHFORD (Bailey K.). **The Anemias of Sprue. Their Nature and Treatment.**—*Arch. Intern. Med.* 1930. May. Vol. 45. No. 5. pp. 647–673. With 13 charts. [2 refs.] [School of Trop. Med., Univ. of Porto Rico, San Juan, & Columbia Univ., New York.]

Twenty-four cases of sprue with the pernicious type of anaemia were studied for the purpose of contrasting them with a non-megaloblastic type of anaemia.*

The anaemias are considered as falling into two divisions, (1) the nonmegaloblastic or "secondary" anemias, (2) the megaloblastic, medullary or "primary" anaemias. The use of liver as a therapeutic agent for the treatment of patients with megaloblastic anaemia has afforded a ready means of dividing pernicious anaemias into those which yield a definite rise in reticulocytes and those which do not. The pernicious forms are divided into dysplastic, hypoplastic and aplastic types.

In this series of anaemia, sixteen cases had developed during the course of sprue and all but one of these were megaloblastic in type. Eight of the sixteen were cases of dysplastic anaemia, of which six yielded a definite rise in the number of reticulocytes after administration of liver extract prepared by Lilly and Co.

The results of treatment in dysplastic types of anaemia were satisfactory in so far that all but one of the patients were cured during a period varying from two to five months. By rough calculation the average number of days required for liver extract to effect a rise in reticulocytes was five.

[The remainder of this paper is almost impossible to summarize on account of the number of tables and graphs and individual protocols of illustrative cases.]

P. H. M-B.

NUNEZ (P. Escuder). Un cas de sprue? (Auto-observation.) [**?A Case of Sprue. By the Sufferer.**]—*Presse Méd.* 1930. May 3. Vol. 38. No. 36. pp. 606–607.

This is a well-told tale of sprue by a Montevideo doctor who was himself the victim. In December 1926, whilst in Paris, he began to suffer from glossitis, which caused him little concern as otherwise he was in perfect health. On his return to Uruguay this symptom continued with exacerbations till October 1928, that is to say, for two years. In the meantime his general condition changed. He began to waste and to be easily fatigued, and sprue-like diarrhoea appeared. The symptom complex was as follows: Aphthous glossitis, sprue-like diarrhoea, loss of weight to 23 kilos, anaemia, lack of assimilation, pigmented patches on the forehead and temples. This state of affairs continued till June 1929; many remedies were tried in vain. Only blood transfusions, of which he had twelve, totalling two litres, greatly improved the anaemia, but did not stop the

* There appears to be a growing tendency to describe this anaemia as of the megaloblastic type. In only two of the cases detailed are normoblasts mentioned and there is no record of megaloblasts being present. In one (case 4) there were 8 normoblasts per 100,000 red cells; nevertheless, it is stated "a typical megaloblastic anaemia curve . . . is seen"; and in case 5 "no normoblasts were ever seen . . . This case is in many respects one of the most illustrative in the series of the characteristics of the megaloblastic anaemias of sprue." Seeing that the chief characteristic change in the red cells is the relatively large number with a diameter above the normal, would not "*megalocytic type*" be a more appropriate term?—[ED.]

diarrhoea. In June 1929 he read a paper by Dr. Ed. ANTOINE [this *Bulletin*, Vol. 26, p. 491] and realized that he was suffering from sprue, though it had never been recorded in Uruguay, Argentina, or Chile. An appropriate régime with calcium carbonate and neutral phosphate of calcium by mouth helped to cure him. Search for the *Monilia psilosis* of Ashford, in the faeces, proved consistently negative.

He considers this the first case of autochtonous sprue to be recorded from Montevideo.

P. H. M-B.

LOW (G. Carmichael) & DIXON (D. Strangways). **Pseudo-Sprue.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1930. Mar. 17. Vol. 23. No. 5. pp. 525–528. [Hosp. for Trop. Diseases, London.]

Pseudo-sprue indicates a clinical condition which somewhat resembles true sprue, but which eventually declares itself to be something else. In this striking case the patient had been ill for two years with fatty diarrhoea and very considerable abdominal pain located in the right iliac fossa. A provisional diagnosis of carcinoma of the transverse colon was made and at operation a colloidal carcinoma of the head of the pancreas was demonstrated.

The moral is that in diagnosis too much reliance should not be placed upon fat analysis of the stools, which in this case was misleading, the proportion of neutral fats to fatty acids being 1 : 5, whereas in carcinoma of the pancreas the opposite should have obtained.

P. H. M-B.

HAMET (H.). Revue des travaux récents à l'étranger sur la sprue tropicale. [**Review of Recent Work on Tropical Sprue.**]—*Bull. Soc. Path. Exot.* 1929. Dec. 11. Vol. 22. No. 10. pp. 998–1009. [6 refs.]

A review of recent work on sprue mainly with reference to the contributions of ASHFORD and the value of monilia vaccines in treatment, all of which have received adequate notice in this *Bulletin*.

P. H. M-B.

REVIEWS AND NOTICES.

SALZBERGER (M.). **Die Lepra der oberen Luftwege und des Ohres in Palästina und Cypern.** [Leprosy of the Ear and Upper Air Ways in Palestine and Cyprus.] Erweiterter Sonderabdruck aus *Monat. f. Ohrenhk. u. Laryngo-Rhinol.* 1928. Jr. 62. Hefte 10–12. 44 pp. With 10 text figs. & 3 coloured plates. 1929. Urban & Schwarzenberg: Berlin N, Friedrichstrasse 105. Vienna I, Mahlerstrasse 4. [Unbound Rm. 4.]

Dr. Salzberger's experience in what may well be termed the classic land of leprosy has given him an opportunity of which he has taken good advantage. For, as a matter of fact, although the disease causes widespread change and destruction in the regions of the throat, nose and ear, very little attention has hitherto been paid to it by otolaryngologists. For that reason, we extend to this monograph a hearty welcome, coupled with a mild regret that the author has left his work so incomplete.

The fact is that although he has given detailed, and even minute descriptions of the manifold changes visible in the leprous nose, throat, and ear, he paints them as if from stationary pictures, relying largely upon statistics. But when we look for a compendious account of the march of a progressive disease from start to finish, we look in vain. Doubtless, opportunity is wanting in so slowly progressing a malady to follow a number of cases throughout their long career. But this difficulty could have been overcome surely by the assembling of the individual items from early, medium, and late cases, and by building up, in that way, a complete history of the disease as it affects these regions.

Apart from that drawback, however, the brochure is a praiseworthy piece of conscientious work and is sure of a welcome from the otolaryngological practitioner.

The book is well illustrated, the black and white figures being particularly useful. A number of coloured plates are also supplied. They are moderately good. There is no index.*

Dan McKenzie.

MUIR (E.) [M.D., F.R.C.S. (Edin.), Research Worker in Leprosy, School of Tropical Medicine and Hygiene, Calcutta]. **Leprosy, Diagnosis, Treatment and Prevention.** Fifth Revised Edition.—67 pp. With 25 figs. Published by the Indian Council of the British Empire Leprosy Relief Association, Delhi and Simla.

The fact that this popular little work has reached the fifth edition shows that it has admirably fulfilled its purpose in bringing the practical essentials regarding the disease into a small compass for the use of the numerous body of medical men in India and elsewhere who are engaged in treating lepers on modern lines. Advantage has been taken of the opportunity to bring the work up to date by including an account of the red corpuscle sedimentation test, which has proved of much value in regulating the dosage of the drugs used, to ensure that no unduly severe and injurious reactions are produced. The hot and cold processes of

* The tropical practitioner in charge of leprosy camps and the like will be chiefly interested in the following (in original) extract from Dr. Salzberger's preface —

"No Leper can be regarded as really negative on the sole ground of negative results of smears, taken haphazardly from the air passages. Dr. Canaan's and my experience in the Leper House in Jerusalem, has shown that in 25 per cent. of such Lepers who have been for 2 years or more negative for the bacilli of Hansen, were positive, when the smears were taken by a Laryngo-rhynologist."

[ED.].

preparing hydnocarpus esters have been reintroduced to meet the requirements of leper institutions, and the lines are sketched on which leprosy surveys and campaigns have been elaborated in accordance with recent experience in India. The new edition is certain to retain the great popularity of its predecessors.

L. Rogers.

Hermant (P.) & Cilento (R. W.). **Report of the Mission entrusted with a Survey on Health Conditions in the Pacific Islands, October 1928 to April 1929.**—League of Nations. Health Organisation. C.H.829. 116 pp. With 2 text figs. & 5 maps. 1929. Dec. Geneva.

Dr. P. Hermant, of the French Service in Indo-China, and Dr. R. W. Cilento, Director of the Division of Tropical Hygiene of the Australian Commonwealth Department of Health, were chosen to make a preliminary survey of certain archipelagos in the South Pacific under a scheme promoted by the Health Organisation of the League of Nations. The purpose of the visit was not the carrying out of research but the surveying of the outstanding problems of the country. The authors were away from Australia between five and six months, and during that time they visited south-east New Guinea and a number of accessible places ranging through Melanesia to Fiji. They did not visit any places in Polynesia, so that the title of the report is perhaps a little inappropriate.

It is not easy to gain any concrete information from reading the results of the tour. A considerable proportion of the space is devoted to programs of work which might be done. This is followed by short accounts of the prevalent diseases, among which the most important are yaws, ankylostomiasis, filariasis and malaria. The medical education and nutrition of the native races and other topics are also discussed in general terms. Little that is said is new, and after reading the report one feels that, though the authors rightly emphasize the enormous amount that yet remains to be done, their readers will hardly appreciate the considerable body of ascertained facts which already exists. They give, for instance, 2½ pages of generalizations to the depopulation of parts of Melanesia, and they rightly say that this is perhaps the gravest of all public health problems of the country. They lament the " prevalence of opinions and paucity of authoritative figures " but they make no reference to several collections of numerical data which have been published, of which perhaps the most notable is Baker's detailed survey of an area in the island of Santo, New Hebrides [see this *Bulletin*, Vol. 26, p. 416].

P. A. Buxton.

d'Herelle (F.), Malone (R. H.) & Lahiri (M. N.). **Studies on Asiatic Cholera.**—*Indian Med. Res. Memoirs. Supplementary Series to Indian Jl. Med. Res.* 1930. Feb. Memoir No. 14. pp. v+161. With 8 charts on 6 plates. [Refs. in footnotes.]

The researches here set forth were undertaken at the invitation of the Government of India and financed by a grant from the Indian Research Fund Association. They include a study of the pathology of cholera in patients treated in the Campbell Hospital, Calcutta, where the study can be seriously undertaken. Results thus obtained were confirmed in a series of experiments conducted in villages of the Punjab on patients treated in their own homes. In the course of these researches the authors also studied the various properties of the vibrios isolated ; made a collection of bacteriophages virulent for the vibrios ; observed the effect of the ingestion of cultures of bacteriophages on persons attacked by cholera and the effect on the bacteriophages of passages through the bodies of patients. They also studied the action of bacteriophages on vibrios *in vitro* and the muta-

tions produced. Chapter I deals with the various characters and life history of the cholera vibrio. The characters appear to be very stable with the exception of virulence, which seems to be lost very rapidly when the organism is cultivated outside the body of man, but can be regained when circumstances are favourable. The nature of its toxigenic power is unknown. A full description of the cholera bacteriophages is given and it is stated that the bacteriophage is a living corpuscular being, extremely minute, belonging to the protobes (ultra-viruses). It is a parasite of bacteria which it destroys while reproducing at their expense. The general characters of the bacteriophages on cholera vibrios are the same as those of other bacteriophages already discovered and the technique of their isolation is the same. In the intestines of patients both vibrios and bacteriophages possess individuality which is lost by serial cultures on artificial media. The bacteriophage is a normal inhabitant of the intestines, where it parasitizes the saprophytic bacteria of the normal intestinal flora and multiplies at their expense. It varies in virulence, but may reach a maximum virulence rapidly, when the vibrios are rapidly destroyed, the symptoms disappear and the patient becomes convalescent. A cultivated bacteriophage of maximum virulence given by the mouth will therefore be useful for treatment (it must not be injected) and a table given on page 97 shows this to be the case. Out of 17 cases so treated only 1 died, while out of 18 control cases 12 died. Several other tables from other villages give similar relative results. Part II contains also much interesting matter connected with the pathology of cholera. Part III deals with epidemiology and prophylaxis.

J. H. Tull Walsh.

PLÁ (Juan C.), TALICE (Rodolfo V.) & SURRACO (Norris L.). **La fiebre recurrente española. Estudio clínico y experimental.** [Spanish Relapsing Fever. A Clinical and Experimental Study.] —*An. Facul. de Med.* Montevideo. 1929. Oct. & Nov. 1930. Feb. 107 pp. With 38 figs. & 10 diagrams. [15 refs.]

This monograph gives a very good survey of the *Treponema hispanicum*, and the symptoms it produces, its biology, transmission, and its employment in the treatment of other diseases. The work starts with the history of Spanish relapsing fever. The first recorded case was that of Sadi de BUEN in 1922, and the same investigator later reported on 65 cases seen between 1922 and 1926. Since then others have noted cases. Next follows an account of the aetiology of the disease, the biology of the Treponema and its transmission by *Ornithodorus marocanus* and of the experimental work in connexion therewith mainly carried out by NICOLLE and ANDERSON at the Pasteur Institute, Tunis. The author also made a study of the possibility of conveyance by *Pediculus vestimenti* in Montevideo, but with negative results. Clinical investigations are exemplified by charts and accounts of patients, from which it is seen that the incubation period varies within fairly wide limits of 1 to 7 days, the average being 4 days. The febrile period lasts 3–4 days and the apyrexial for 8 days. The symptoms are considered in detail and an account of the blood changes, by which it is seen that there is an invasion leucocytosis up to 18,000 per cmm. with a fall as low as 4,000 at the end of the febrile attack and beginning of the period of apyrexia, while there is considerable anaemia to 2,800,000 red cells per cmm. The disease reacts very readily to injections of salvarsan, but if left untreated spontaneous cure usually takes place in 2–2½ months.

The final section of the monograph deals with the application of the *T. hispanicum* in the treatment of general paralysis, tabes, dementia praecox, etc., for which it is considered particularly suitable owing to the mildness of the disease set up and its easy control by arsenicals. It is thus believed to be better than malaria for this purpose. The work is well illustrated by charts clearly reproduced.

H. H. S.

Proceedings of the Third Scientific Medical Congress of Middle Asia, 20-24 December, 1928.—Supplement to *Pensée Méd. d' Usbéquistane et de Turqumenistane.* Tashkent. 1929/1930. 316 pp. [In Russian.]

The proceedings contain over 150 abstracts of papers in the various branches of medicine read at the Medical Congress in Tashkent. The following is a review of some of the papers dealing with diseases of tropical and sub-tropical countries.

L. M. Issayev discusses " The Epidemiology of malaria in Middle Asia " (p. 18). In 1922 the whole country was overrun by an epidemic of malaria which subsided only towards 1928. As the incidence of malaria diminished the predominant form of parasite changed. *Plasmodium falciparum* was replaced by *P. vivax* and the latter by *P. malariae*. In some regions, chiefly in the plains, the malarial indices fell to a very insignificant figure. In these regions malaria is of an epidemic character. In other regions the degree of infectivity remained fairly constant, malaria being endemic. The only regions which can be regarded as free of malaria are the non-irrigated areas of the plains and the mountainous regions over 5,000 feet above the sea.

One of the factors responsible for the diminution of malaria was the gradual amelioration of the economic conditions in the country, especially the increase of arable land and improvements of irrigation.

Yakovlev, A. F. " Combined treatment of malaria with arrenal and quinine " (p. 21). Twenty-six relapse cases were treated as follows. Every other day 0·5–1·0 cc. of 5 per cent. arrenal was injected intravenously, and in the intervening days subcutaneous injections of 2 cc. 30 per cent. quinine hydrochloride and 1·5 per cent. methylene blue were administered. In the evening following the injection of arrenal 0·6 gm. quinine was given orally. The whole course of treatment consisted of four injections of each drug. The course was followed by interrupted quininization during one month. The treatment resulted in a cure in 22 cases, and no relapses were observed during 1½–2 years in 20 cases. The best results were obtained with tertian fever, then with quartan, whilst in the case of malignant tertian with crescents the results were least satisfactory.

Issayev, L. M. " Epidemiology of guinea-worm infection in Middle Asia " (p. 51). Measures for the eradication of guinea-worms in the township of Old Bokhara are described. A systematic examination of the population was undertaken and those found infected were treated in hospital. In order to prevent dissemination of the microfilariae collodion dressings were used and mercury perchloride was injected into the worm. Cyclops were collected from all the ponds and examined for filariae. Ponds in which infected crustaceans were found were closed up, dried and cleaned.

As the result of these measures, carried out in the course of the last five years, the incidence of guinea-worm infection which reached 20 per cent. in a population of 50,000, fell to ⅓ per cent. in 1928. It is expected that by 1931–1932 the guinea-worm will have disappeared from the locality. The author notes that dogs have been experimentally infected with this nematode, and it is hoped that use can be made of this animal for the study of some obscure points in the biology of this worm.

Moltchanov, S. A., and Burova, L. F. " The Effect of X-rays upon Leishmania cultures " (p. 56). In connexion with the method of treatment of leishmaniasis with X-rays their effect was tested upon cultures of *Leishmania donovani* and *L. tropica*. NNN cultures were exposed to the action of from 50 to 500 per cent. NED. Both species of *Leishmania* were found to be susceptible to X-rays. The number of parasites decreased, degenerate forms appeared and the culture died much earlier than the controls. The rate of destruction depended upon the dose of rays (optimum 70–100 per cent. *NED*) and the age of the culture, 6-day cultures being the most resistant, while older cultures perished more rapidly.

Shevtchenko, F. I., and Sofiev, M. S. "On the viability of *Leishmania canis* in the gut of *Phlebotomus papatasii*" (p. 64). The authors record some experiments of infection of sandflies with *Leishmania canis*. It is noted that 96 per cent. of the flies ingested parasites with the blood. During the first 19 hours of development in the sandfly the parasites remain in the leishmania stage after which flagellate forms appear. In the majority of fed sandflies the flagellates degenerate and die out, only very few remaining infected after the fifth day.

Chapurskaya-Bajenowa. "On Lambliasis and its treatment with Osarsol" (p. 116). It is maintained that *Giardia intestinalis* is pathogenic to man, its occurrence in the duodenum being associated with the presence of mucus and pus. Cases were treated with Osarsol, a Russian preparation of the same composition of stovarsol. The method of treatment and dosage are not indicated. Repeated treatment resulted in disappearance of the clinical symptoms, but the parasites did not disappear entirely from the stools, the host becoming a carrier. In some cases relapses were observed.

C. A. Hoare.

Findlay (G. M.) [O.B.E., M.D., D.Sc., Wellcome Bureau of Scientific Research, London]. **Recent Advances in Chemotherapy.** With a Foreword by C. M. Wenyon, C.M.G., C.B.E., M.B., B.S., B.Sc., F.R.S.—pp. viii+532. With 11 text figs. & 4 plates. 1930. London: J. & A. Churchill, 40 Gloucester Place, Portman Square. [15s.]

The scope of this book is defined in the preface as "an attempt . . . to describe the more important advances in chemotherapy which have occurred during the post-war period." In old established sciences such as anatomy and physiology, and even in bacteriology, there is an abundance of text-books which contain the accepted facts and current theories, so that recent advances may be adequately dealt with in a series of independent essays. But systematic experimental investigation on chemotherapy practically began with Ehrlich and Shiga's researches on trypanred published in 1904, and during the following 10 years work on the subject was limited to a few laboratories where pioneer investigations were carried out. In a new field, especially under the inspiration of an experimenter of genius such as Ehrlich, there is likely to be a rich harvest of discovery—and this was the case in chemotherapy. But very few books, especially in English, contain a systematic account of the early investigations, and as they are referred to in the present volume only incidentally the reader may not see clearly wherein the advances consist. There would have been a good excuse for regarding the whole of the past quarter of a century's work as recent advances. The biological bearings of chemotherapeutic research could then have been developed in a connected fashion, since the first period produced a great number of important positive achievements, while the later years have afforded evidence that many theoretic generalizations based on the early work were too broad and require qualification. As the author has restricted the aim of his book, however, it may be said that it contains digests of a very great quantity of recent literature and also treats of some of the earlier work. The ground covered is extremely wide—infections caused by helminths, protozoa, spirochaetes, fungi, bacteria and viruses, both in man and animals, are dealt with, as well as cancer. The difficult problem of relations between chemical constitution and therapeutic action receives considerable attention. Prominence is given to the results of treatment in the human subject and many therapeutic details are included; as might be expected, there is a considerable mass of contradictory statements. Occasional neglect of experimental evidence seems to be responsible for such a generalization as that "infections due to bacteria are at present largely uninfluenced by chemotherapy. This

failure applies both to localized infections and to general septicaemic conditions." While it is accepted that the only septicaemic affection amenable to a chemotherapeutic agent is that due to the pneumococcus in mice when treated with optoquine, considerable progress has, however, been made in the treatment of localized bacterial infections. Again, one reads that " all the chemical antiseptics at present in use in addition to combining with bacterial protoplasm and so causing death of the bacteria also enter into combination with other albuminous matter and are, in fact, general protoplasmic poisons " ; this statement is true in the sense that all substances are poisons when the dosage is excessive, but it seems to neglect the differences in relative toxicity for bacteria and for mammalian tissues exhibited by substances such as phenol and corrosive sublimate on the one hand, and antiseptics such as those of the acridine series on the other.

It should be remarked that WALBUM's metal salt therapy is not mentioned, since it promises to be one of the most striking of recent advances. Also, this form of therapy appears to be an outstanding example of the fact stated by the author in his preface that " the focus of attention has tended to shift from a study of the direct interaction of drugs with infecting organisms to an investigation of the part played by the tissues in chemotherapeutic treatment."

The book affords a valuable store of references for those interested in any particular aspect of chemotherapy and as such should be highly appreciated.

C. H. Browning.

REED (Alfred C.) [M.D.]. **Tropical Medicine in the United States.**—pp. xiii+410. With 60 illustrations. 1930. Philadelphia & London : J. B. Lippincott Co. [25s.]

In his preface Professor Reed, of the University of California, says he has had one object only in view : " to present a serviceable guide to the physician in the United States in his contacts with tropical medicine." " Not a monographic review or an exhaustive text-book, but a useful clinical pocket guide has been our object." The author has most successfully attained his object ; he has produced an eminently readable book but one which should be classed as a text book rather than a pocket guide. Certain subjects for good reasons are not dealt with, such as African trypanosomiasis and melioidosis, and others are dealt with shortly, such as Brazilian trypanosomiasis. On the other hand, among protozoal diseases intestinal flagellosis, ciliosis and coccidiosis are dealt with, under bacillary diseases tularaemia finds a place, under mycotic diseases mycotic splenomegaly, blastomycosis and bronchomycosis receive notice. Systematic parasitology naturally finds no place in this volume, but there is a useful chapter on arthropod parasites.

A few minor criticisms may be made. While the causal organism of relapsing fever is referred to as *Treponema recurrentis* those of syphilis and yaws are given as *Spirochaeta pallidum* and *pertenue*. Oxyuris appears (perhaps purposely) instead of enterobius, etc. Some printer's errors were noted : SINTON's name appears as Linton and ROUSSEL as Roussa. Again, it is questionable if it be correct to speak of the small outbreaks of yellow fever which have occurred in south European seaports in the terms—" Europe has been visited by devastating epidemics in recent times." Some expressions, too, are liable to misinterpretation. In speaking of the work of the Rockefeller Commission on yellow fever in West Africa, " They found, most important of all, that the common monkey, *Macacus rhesus*, was very susceptible to yellow fever," leaving the reader to believe that this monkey is common in W. Africa.

Under relapsing fever reference is made to great enlargement of the spleen and liver and to the abundant spirochaetes in the blood during the

febrile attacks, but it is not noted that these phenomena are very variable. The sections on climatic bubo and inguinal granuloma, diseases upon which a good deal has been written in recent years, are poor, and pellagra, upon which one might have expected a better account, is rather sketchily dealt with. These are but minor points which will doubtless receive attention in the next edition of a book which will prove a most useful one to American practitioners.

H. S. Stannus.

GABBI (Umberto) et al. **Relazione a S.E. Emilio de Bono ministro delle colonie degli studi compiuti nel Bassopiano Occidentale dell' Eritrea dai Professori Umberto Gabbi—Luigi Piras—Edoardo Zavattari—Mario Peruzzi—Giovanni Di Domizio—Alberto Ciotola e delle indagini complementari fatte in Italia dai Professori Alberto Camis e Alfredo Chistoni. 7 Gennaio-18 Marzo 1930—Anno VIII êra fascista. Agordat—Parma—Pavia—Padova.** [Medical Report on Western Eritrea.] pp. vii+309. With 129 figs. & 2 plates. 1930. Parma: Prem. Tip. Riunite Donati.

This is a report submitted to the Minister for the Italian Colonies by a medical mission working in western Eritrea from January to March, 1930. The constitution of the mission is sufficiently set forth in the title, and full details of the work which the members set out to accomplish in human and veterinary medicine are given in the early pages of the report. A description of the country, its climate and products is given and special attention is paid to the irrigation works of the plains of Tessenei destined to become a valuable area for the growth of cotton. The general and common diseases do not require much notice. Professor Gabbi contributes papers on malaria, syphilis, yaws, leprosy, etc. As regards malaria the chief transmitter is *Anopheles costalis*. The question of bovine pest and the possibility of immunization is discussed and there is a long and well-illustrated chapter on trypanosomiasis in cattle caused by *Tr. cazalboui*. Plants with medical or poisonous properties are noted. Prof. Zavat ari describes the snakes, scorpions and blood-sucking mites, ticks and flies, each section being well illustrated; indeed, the number of illustrations is a marked feature of this book. Prof. Camis writes about the alimentary food-stuffs in use in the area visited.

J. H. Tull Walsh.

ESCOMEL (Edmundo). **La tricomonosis intestinal.** [Intestinal Trichomoniasis.]—57 pp. 1929. Lima: Imprenta Torres Aguirre.

This is a monograph summarizing the author's views on a subject which he has studied since the beginning of the century. He states that "between 1898 and 1913, 150 cases of disease due to *Trichomonas intestinalis* had been proved in Arequipa alone" and since 1913 the numbers of patients observed had quadrupled. He regards the infection as constituting a definite morbid entity and occurring in Europe, Asia, Africa and America. The flagellate may exist saprophytically, or may assume pathogenic properties and give rise to symptoms which he classifies as dysenteric, with or without blood, choleriform, acute passing to chronic, and chronic with exacerbations. An account of its life-history and of the differences between the intestinal and vaginal forms is given. Diarrhoea, with spontaneous recovery, followed rectal injection of material containing the parasite into cats and dogs; in human cases infection may be direct, or through the agency of flies and other insects, or by water, any gastro-intestinal disturbance of an irritant nature predisposing. As complications

he mentions intestinal perforation and hepatitis going on to abscess formation, and describes illustrative cases of these. Intestinal ulceration is found post-mortem. Treatment by means of ipecacuanha, calomel, creosote, β-naphthol, tannalbin, etc., is ineffectual, but turpentine by mouth and by enema, and iodine irrigations are regarded as specific. Diagnosis is made by finding the parasite in the faeces, often in large numbers, and as they disappear so the symptoms abate. [It is noteworthy that neither in the pus of the liver abscess nor in the sections made of the intestine was Trichomonas detected; at all events this fact is stated in the former and no mention is made of them in the latter, though minute histological details are given. Further evidence will be needed before the pathogenicity of Trichomonas is generally accepted.]

H. H. S.

Escomel (Edmundo). **Las disenterias en Arequipa.** [Dysentery in Arequipa.]—109 pp. With 6 figs. on 4 plates. 1929. Lima: Imprenta Torres Aguirre.

This is stated by the author to be a work presented at the Pan-American Medical Congress held in Lima in 1913, with corrections and additions. He divides the forms as seen in Arequipa into amoebic, trichomonad, balantidial, malarial, lamblial and that due to *Tetramitus mesnili*. Bacterial dysentery does not occur, or is very rare. "Capsicum dysentery" due to the excessive use of condiments, and diarrhoea associated with the presence of Blastocystis, "cancerous dysentery" and "dysenteriform colitis" due to hookworm, are also noted. [The term dysentery has been given a very wide application, covering diarrhoea generally.] The major part of the article is devoted to Trichomonas infestation and is in the main a repetition of the preceding, the other receiving but a few words.

A second paper by the same author, written in French, covers much the same ground, with an additional note on 25 cases of liver abscess cured by emetine without surgical intervention. A few remarks on some flagellates found in Batrachia and reptiles, and a brief account of a diabetic aged 60, in whose urine withdrawn by catheter were numerous living Trichomonas with the characters of *T. vaginalis*, conclude the paper.

H. H. S.

Leitch (J. Neil) [M.D., B.S. (London), M.R.C.S. (England), etc., Pathologist, West African Medical Service, etc.]. **Dietetics in Warm Climates, including Foodstuffs, their Analyses and Rôle in Disease.** With an Introduction by His Excellency, Brigadier-General Sir J. A. Byrne, K.C.M.G., K.B.E., C.B.—486 pp. With 62 figs. on 35 plates. 1930. London: Harrison & Sons, Ltd., 44–47, St. Martin's Lane, W.C. 2. [25s.] [Review appears also in *Bulletin of Hygiene*.]

There are many who believe that man's instincts and natural appetites are trustworthy guides to the selection of the food that is best for him. This view is sometimes supported by the contention that uncivilized man exhibits to-day a freedom from diseases associated with defective feeding which are rife among the more cultivated races. One of the purposes of this volume is to convince the reader that, however reliable man's feeding instincts may be in theory, in every quarter of the world at the present day the less civilized races of mankind are suffering even more from diseases directly or indirectly associated with dietary deficiencies than the more highly civilized races. The mass of information it contains includes a

survey of dietaries in Asia, Africa, South America and the East and West Indies, lists of tropical foods, including in many instances their chemical analysis and special nutritive or toxic properties, and an account of the known facts regarding the relation of diseases met with in the tropics to specific food deficiencies.

The subject is a vast one and requires for its adequate treatment personal experience in all quarters of the globe. The author has himself had medical experience both in Africa and the Far East and is therefore intimately acquainted with many of the dietary problems which he deals with. For the rest he has relied on replies to a circular letter broadcasted throughout the tropics and on original papers published in medical and scientific journals which he is constantly quoting at considerable length. It is most unfortunate that the heavy expenses of publishing this compilation should have made it appear advisable to include bound up in the text a good deal of advertising matter, which must shock the reader who is dispassionately seeking the truth in what is apparently a scientific treatise. Nevertheless, the white man who wishes to know how he can best feed himself and his family in the tropics, or the administrator supervising the dietaries of natives under his care will each find much valuable information at his disposal in the present work and the numerous references to original papers will enable the reader to pursue further any subject in which he is particularly interested.

S. J. Cowell.

McKendrick (A. G.). **Analytical Review of Reports from Pasteur Institutes on the Results of Anti-Rabies Treatment.**—League of Nations. Health Organisation. L.o.N.P. III. Health. 1930. III. 2. 158 pp. Geneva.

Following a resolution of the International Rabies Conference, convened by the League of Nations in 1927, a questionary as to the results of anti-rabies treatment was sent to every Rabies Institute throughout the world. Reports relating to 31,656 persons treated by various methods have been subjected to statistical analysis by Lt.-Col McKendrick and are here published in full, together with his conclusions, and certain other reports not included in the analysis. The schedule asked for details as to methods of treatment in use at the institute, the numbers of persons treated and deaths in a year classified according to race, animal responsible, evidence of rabies in the biting animal, depth and location of the bite, interposition of clothing and interval before treatment was commenced. The reports published in detail are from 22 institutes in Europe, 8 in Asia and one in Morocco, and the statistical analysis is based upon 30 of these. In addition there is a tabulation of 111,427 persons treated by 64 institutes in the Soviet Republics, received too late for inclusion in the analytical review. No information has yet been received from some 50 other institutes, and it is intended to publish further reports later.

The methods of treatment have been grouped for analysis under five main headings: (1) those employing cords dried for more than 24 hours; (2) a group of dilution methods in which the virus is presumed not to have been killed in the preparation; (3) methods using vaccines killed by phenol; (4) ether vaccines without addition of phenol; (5) ether vaccines subsequently killed by phenol. In the whole material the mortality averaged 0·49 per hundred treated. The significance of differences in mortality has been tested by calculating P, the probability that a given set of differences would occur in samples from a homogeneous population, and it is shown that the differences in mortality in the five treatment groups, and between live and killed vaccine groups, are for the most part accounted for by differing proportions of Europeans and non-Europeans in these groups. Thus the persons treated by dilution and ether methods were almost

entirely Europeans, whereas four-fifths of those treated by killed phenol vaccines were Asiatics. The distribution of mortality rates amongst the various institutes is also such as might be expected by chance when the statistics for the two racial groups are dealt with separately, but not if they are combined.

The main conclusions are therefore : (1) that non-Europeans are subject to a higher mortality risk than Europeans, and (2) that there is no decisive evidence that any clear advantage as regards mortality exists in favour of any one of the various methods, but the second conclusion is only provisional until larger statistics have been collected. As regards the influence of other factors, it is shown that wolf bites are about 40 times as fatal as dog bites, and are as fatal in Europeans as Asiatics, the mortality amongst those treated being 18 per cent. The relation of mortality to delay in starting treatment is ambiguous, for whereas those treated with phenol vaccines, mostly Asiatics, show a risk increasing with delay, this is not the case for other methods of treatment.

Intervention of clothing reduces the mortality six-fold, as previously found. Reference to the actual returns shows that about 70 per cent. of bites treated in European institutes were on the bare skin, so that even if we were to regard all clothing of Asiatics as too thin to afford protection, it appears that only a small fraction of the observed racial difference could be thus accounted for.

It should be noted that this investigation tells us nothing about the absolute value of any of the prophylactic methods in reducing risk, owing to absence of any control series which would be difficult to obtain, and the conclusions are such that they give no indication as to how great is the saving in mortality effected by the Pasteur institutions. This, however, was not the purpose of the research. In the work before us Lt.-Col. McKendrick has undoubtedly made the best possible use of the material at his disposal and has exercised a most commendable caution in his process of analysis and in interpreting the results of it.

P. Stocks.

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The bracketed abbreviations after the page numbers indicate the subjects.
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Am. signifies Amoebiasis and Amoebic Dysentery.
Bb. ,, Beriberi.
Bl. ,, Blackwater.
B.R. ,, Book Review.
Chl. ,, Cholera.
C.Bu. ,, Climatic Bubo.
Der. ,, Tropical Dermatology.
Dys. ,, Dysentery (Bacillary and Unclassed).
Ent. ,, Enteric Fevers.
Fev. ,, Fevers.
G.V. ,, Granuloma Venereum.
Hel. ,, Helminthiasis.
Hist. ,, Historical.
H.S. ,, Heat Stroke.
K.A. ,, Kala Azar.
Lab. ,, Laboratory Reports.
Lep. ,, Leprosy.
Lept. signifies Leptospirosis.
Mal. ,, Malaria.
Misc. ,, Miscellaneous.
Myc. ,, Tropical Mycology.
Oph. ,, Tropical Ophthalmology.
Pel. ,, Pellagra.
Pl. ,, Plague.
Rab. ,, Rabies.
R.B.F. ,, Rat-Bite Fever.
R.F. ,, Relapsing Fever and other Spirochaetoses.
Sp. ,, Sprue.
S.S. ,, Sleeping Sickness.
Tb. ,, Tuberculosis.
Und. ,, Undulant and Abortus Fever.
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Y. & S. ,, Yaws & Syphilis.
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Burowa, L. F., 613 (K.A.), 803 (Dys.)
Businco, O., (220) (Mal.)
Buss, G., 100, 623 (K.A.)
Busson, B., 254, 746 *bis*, 748, 752 (Rab.)
Butler, C. S., 720 (Y. & S.)
Butler, G. G., 942 (Lab.)
Buxton, P. A., 56 (Misc.)

C

Cacciapuoti, G., 660 *bis* (Mal.)
Cairo, 778 (B.R.)
Caius, J. F. & Naidu, B. P. B., 734 (Pl.)
Calalb, G., 397 (Dys.)
Calcutta, 946, 947 (B.R.)
Calderini, M., 255 (Rab.)
Caldwell, F. C. & Caldwell, E. L., 981 (Hel.)
Califano, L. & Gritti, P., 854 (S.S.)
Callan, A. M., with Lynch, 546 (Und.)
Cameron, T. W. M., 49 (Misc.), 267 (Z.), 983 (Hel.)
Caminopetros, J., with Blanc, 146 *bis* (Fev.), 309 (Z.)
Campbell, H. E., (130) (R.B.F.)
——, with Faust & Kellogg, (993) (Hel.)
Campbell, W., 782 (Am.)
Campos, E. de S., 248, 840 *bis* (S.S.)
Canaan, T., 99 (K.A.), 336 (Lep.)
Cannon, A., 759, 760 (Bb.)
Cantani, F., 137 *bis* (Und.), 472, 970 (Hel.)
Capri, M., with Dorogan, 777 (Pel.)
de Capua, F., 96, 619 (K.A.)
Carda, P., with Angolotti, 243 (S.S.)
Cargill, L. V., 1013 (Oph.)
Carley, P. S., 776 (Pel.)
Carman, J. A., 954 (Hel.)
Carmouze, 327 (Lep.)
Carneiro, H., (937) (Z.)
Carpano, M., 885 (Z.)
Carpenter, C. M. & Boak, R., 545 (Und.)
Carpenter, G. D. H., (250), 809 (S.S.)
Carral, G. & Chainet, P., 700 (R.F.)
Carrión, A. L., 516 (Der.), 919 (Z.)
Carrosse & Barnéoud, 455 (Hel.)
Carter, H. F., 295 (Z.)
Cartron, 1 (Pl.)
Carvaillo, R., with Deschiens, 174 (B.R.)
Carvalho, M. G., 256 (Rab.)
Cash, J. R. & Hu, C. H., 609, 610 (K.A.)
Cassimatis, C., 502 (Oph.)
Castellani, A., 67 (Misc.), 395 (Dys.), 1021(Sp.)
—— & Duval, C. W., (530) (Der.)
Castellano, T., Orgaz, J. & Luque, F., 967 (Hel.)
de Castro, A., 862 (B.R.)
de Castro, A. M. & Gomes, L. S., 333 (Lep.)
Catanei, A., 514, 516, 517, (530) (Der.)
——, with Sergent, Edm. & Sergent, Et., 893 (Z.)
Catanié, with Remlinger & Bailly, 699 (R.F.)
Cattaneo, L., 704 (Lept.)
Cauvin, with Delpy & Riou, 744 (Rab.)
Cawadas, E., 206 (Mal.)
Cawston, F. G., 66, 172 (Misc.), 461, 465, 466, (473), 962, 963 (Hel.)
Cazanove, 1 (Pl.)
Cazanove, F., 3 (Pl.), 475 *bis* (Y.F.)
Céard, L., 105 (K.A.)
Cerqua, S., 461 (Hel.)
Cerza, L., 617 (K.A.)
Chacón, A. L., 100 (K.A.)
Chadwick, C. R., with Mills & Machattie, 620 (K.A.)
Chagas, 837 (S.S.)
Chagas, E., 838, 839, (854) (S.S.)
Chainet, P., with Carral, 700 (R.F.)
Chambon, with Jamot, 825 (S.S.)
Chandler, A. C., 264 (B.R.)
Charles, J. A. & Warren, S. H., 393 (Dys.)
Chatterjee, J. C., (21) (Chl.)
Chatterji, K. K., 467 (Hel.)
Chavarría, A. P. & Nauck, E. G., 161 (Misc.)
Cheer, S. N., with Robertson, 863 (B.R.)
Chen, F., with Frazier, 1002 (Lep.)
Ch'en, K. T., with Yang, 619 (K.A.)
Cherefeddin, O., 393 (Am.)
Chesneau, P., 501, 1010 *bis* (Oph.), 955 (Hel.)
——, with Bedier, 960 (Hel.)
—— & Tran-van-Manh, 914 (Z.)
Chesterman, C. C., 85 (B.R.)
Chevallier, P., 202 (Mal.)
—— & Schwob, R., 202 (Mal.)
Chiari, H., 984 (Hel.)
Chiasserini, A., 470 (Hel.)
Chia-Swee, with Wu Lien-Teh, Pollitzer & Jettmar, 2 (Pl.)
Chiba, E., with Kobayashi & Furuyama, 439 (Hel.)
——, with Tanabe, 391 (Am.)
Chinaglia, A., with Balbi, 117 (R.F.)
China Medical Journal, 994 (Lep.)
Chitre, G. D., with Mackie, 349 (Sp.)
——, with Webster, 731 (Pl.)

Chodoukine, N. I., 98 (K.A.), 272 (Z.)
Chodukin, N. I., 620 (K.A.)
Chodukin, N. J., with Pawlowsky, 323 (Z.)
Choisser, R. M., 587 (Misc.), 709 (Y. & S.)
Chopra, R. N., with Acton, 184 (Mal.), 388 (Am.), 609 (K.A.)
—— & Choudhury, S. G., 98 (K.A.)
—— & De, N. N., 569 (Misc.), 615 (K.A.)
——, Ghosh, N. N. & Ratnagiriswaran, A. N., 65 (Misc.)
—— & Ghosh, S., 65, 568 (Misc.)
——, Gupta, J. C. & Basu, N. K., 611 (K.A.)
—— & Mukherjee, B. P., 616 (K.A.)
Chorine, V. & Baranoff, N., 308 (Z.)
——, with Marchoux, 701 (R.F.)
Chorley, J. K., 314 *bis* (Z.)
Choudhury, B. K. P., with Morison & Rahman, 855 (Chl.)
Choudhury, K. L., with Strickland, & others, 666 (Mal.)
Choudhury, S. G., with Chopra, 98 (K.A.)
Choudoukine, N. J., 906 (Z.)
Chowdhury, K. L., with Strickland, 903 (Z.)
Christenson, R. O. & Greene, W. P., 459 (Hel.)
——, with Riley, 689 (B.R.)
Christophers, S. R., 183 (Mal.), 574 *ter* (Misc.)
Christopherson, J. B., 44, 67 (Misc.)
Chu, C. K., with Kurotchkin, 532 (Myc.)
Chuan, L. T., with Takahashi, To, Tsuchiya & Abiko, 9 (Pl.)
——, with Tsuchiya, 733 (Pl.)
Ciarrocchi, L., 64 (Misc.)
Cicinnati, A. & Denes, G., 291 (Z.)
Ciferri, R., 519 (Der.)
Cilento, R. W. & Baldwin, A. H., 629 (Mal.)
——, with Hermant, 1025 (B.R.)
Ciotola, A., 80 (Misc.)
Cipriani, P. F., 444 (Hel.)
Ciuca, M., Ballif, L., Vieru, M. & Stirbu, A., 203 (Mal.)
Claassens, J. D. M., 782 (Am.)
Clapham, P. A., with Buckley, 447 (Hel.)
Clark, H. C., 61 (Misc.), 358 *ter*, 886 (Z.)
Clarke, T., 634 (Mal.)
Claxton, E. E., 163 (Misc.)
Clayton, F. H. A. & Warren, S. H., 397 (Dys.)
Clearkin, P. A., 366, 942 (Lab.)
Cleland, J. B., 139 (Fev.)
Clément, 267 (Z.)
Clemesha, W. A., 181 (Mal.)
Cleveland, L. R. & Sanders, E. P., 887 (Z.)
Cloitre, J., 76 (Misc.), 1010, 1013 (Oph.)
Cluver, E. H., 766 (Pel.)
Cochrane, R. G., 325, 337, 1009 (Lep.), 354 (B.R.)
Coghlan, B. A., 229 (S.S.)
Coglievina, B., (152) (Fev.)
Cohen, A. J., with Rodenwaldt, 550 (Und.)
Cohen, J. B., with Browning, Ellingworth & Gulbransen, 235 (S.S.)
Colas-Belcour, J., 324 *bis* (Z.)
——, with Nicolle & Anderson, 107, 692 *bis* (R.F.)
——, with Roubaud, 310 (Z.)
Cole, H. I., 335 *bis* (Lep.)
Collado, J. G., 306 (Z.)
Collart, A., with Schwetz & Fornara, 731 (Pl.)
Collier, W. A., 51 (Misc.), 835 (S.S.)
—— & Krause, M., 232, 835 (S.S.)
Collin, L., 503 (Oph.)
Collins, B. J., with Stiles, 920 (Z.)
Colombani, (10) (Pl.)
Comaroff, R., with Kligler & Geiger, 241 (S.S.)
Commonwealth of Australia, 599 (Misc.)
Compton, A., 396 (Dys.), 735 (Pl.)
Connal, A., 939 (Lab.)
——, Paisley, J. C., Elmes, B. G. T. & Bowrey, R., 9 (Pl.)
Connell, W. K., 387 (Am.)
Connor, F. P., 45 (Misc.), 467 (Hel.)
Cooke, F. H., 995 (Lep.)
Coonoor, Southern India, Pasteur Institute, 750 (Rab.)
Cooper, G. W., (937) (Z.)
Conseil, E., with Nicolle & Durand, 735 (Pl.)
Coppinger, W. V., 26 (Oph.)
Cordier, V. & Morenas, L., 786 (Am.)
Coria, N. A., with Glaser, 886 (Z.)
Corkill, N. L., 969 (Hel.)
Corradetti, A., (937) (Z.)
Correia, A. C. G. da S., (10) (Pl.), 12 (Chl.), 594 (Misc.)
Corson, J. F., 815 (S.S.)
Cort, W. W., Otto, G. F. & Spindler, L. A., 973 (Hel.)
——, Schapiro, L., Riley, W. A. & Stoll, N. R., 440 (Hel.)
——, —— & Stoll, N. R., 421 (Hel.)
——, Stoll, N. R., Sweet, W. C., Riley, W. A. & Schapiro, L., 431 (B.R.)
Cortés, A. F., 92 (K.A.)
da Costa, J. J. G., with Jolly & Shoung, 856 (Chl.)
Costa-Mandry, O., with Weiss, Landron, & Wilkes-Weiss, 353 (Sp.)
Costantini, H., 387 (Am.)
Costantino, S., 612 (K.A.)
Coulon, G., 292 (Z.)
Coutelen, F., (474), 985, 990 (Hel.)
Covell, G., with Barraud, 897 (Z.)
Cowan, J. M., 571 (Misc.)
Cowdry, E. V. & Kitchen, S. F., 475 (Y.F.)
Craig, C. F., 381, 391 (Am.)
Craighead, A. C., with Shortt, Smith, d'Silva & Das, 616 (K.A.)
——, with ——, —— & Swaminath, 95, 604 *bis*, 605 (K.A.)
Crebbin, A. R., 28 (Oph.)
Crichlow, N., 596 (Misc.)
Crimmins, M. L., 359 (Z.)
Crouch, J. H., 22 (Oph.)
Cruickshank, M. M., 1010 (Oph.)
Cruikshank, A. G., 65 (Misc.)
Cruz, J. da C., 478, 480, 868 *bis* (Y.F.)
da Cruz, L. J. C., with de Mello, (406) (Dys.)
Cuboni, E., 112, 699 *bis* (R.F.), 970 (Hel.)
Cuénod & Roger-Nataf, 27 (Oph.)
Cummins, S. L. & Le Roux, J. J. du P., 1005 (Lep.)
da Cunha, A. M., 153 (Fev.)
—— & Muniz, J., 272, 290 *bis* (Z.), 492 (Y.F.)
Cunningham, J., 63 (Misc.)
—— & Malone, R. H., 742 (Rab.)
——, Nicholas, M. J. & Lahiri, B. N., 746 (Rab.)
Curasson, G., 291 (Z.)
Curson, H. H., 817 (S.S.)
Curth, W., with West, 525 (Der.)

Cutler, J. T., with Minot, 569 (Misc.)
Czarkowska, J. & Blank-Weissbeg, S., 699 (R.F.)

D

Daco, 31 (Misc.)
Dalrymple-Champneys, W., 511 (B.R.), 538 (Und.)
Damas Mora, A., 34 (Misc.)
Damon, S. R. & Hampil, B., 122 (Lept.)
Danzel, L., 574 (Misc.)
Darling, G. B., Jr., 261 (Rab.)
Das, S., with Shortt, Craighead, Smith & d'Silva, 616 (K.A.)
Davey, T. H., with Gordon, 813 (S.S.)
Davis, N. C., 488, 874 (Y.F.)
—— & Shannon, R. C., 482, 484 *bis* (Y.F.)
——, with ——, 905 (Z.)
——, with —— & Burke, 905 (Z.)
Dayrit, A., with Pineda, E. V. & Pineda, E. R., 679 (Lep.)
Dchaparidse, P., 59 (Misc.)
De, N. N., with Chopra, 615 (K.A.)
De, P., with Chopra, 569 (Misc.)
Debenedetti, R., with de Lavergne & Abel, 786 (Am.)
——, with —— & Melnotte, 794, 795 (Dys.)
Dechigi-Declich, M. & Favia, N., 135 (Und.)
Deeks, W. E., 187 (Mal.)
Delacroix, M. J. R., 785 (Am.)
Delamare, G., 693, 694 (R.F.)
—— & Gatti, C., 520, 522 (Der.)
Delanöe, E., 24 (Oph.), 681 (Lep.)
Delanöe, P., 106 *bis*, 692 (R.F.), 521 *bis* (Der.)
Del Favero, E., 992 (Hel.)
Dell'Aquila, T., 782 (Am.)
Delpy, J. J. P., with Epaulard & Hornus, 39 (Misc.)
Delpy, L., Cauvin & Riou, 744 (Rab.)
Del Rosario, F. T., with Velasco, Alonso, Limkako & Fernandez, 334 (Lep.)
Demaria, A. & Gallinato, V., 918 (Z.)
Demina, N. A., with Schourenkova, 279 (Z.)
——, with —— & Pavlova, 913 (Z.)
Denes, G., with Cicinnati, 291 (Z.)
Denney, O. E., 673 (Lep.)
——, Hopkins, R. & Johansen, F. A., 673 (Lep.)
——, with —— & ——, 676 (Lep.)
Dérot, M., with Sézary & Guédé, 336 (Lep.)
Deschiens, R., 270, 275 (Z.)
—— & Carvaillo, R., 174 (B.R.)
—— & Kipchidzé, N., 277 (Z.), 791 (Am.)
Dévé, F., 968, 969 (Hel.)
—— & Lessertisseur, M., 969 (Hel.)
Dewar, M. M., with Wayson & Badger, 340 (Lep.)
Dhruv, J. D., 72 (Misc.)
Dikmans, G., 407 (Hel.)
Dimitrakoff, K., (803) (Am.)
Dimitrijević-Speth, V. & Magovcević-Schneider, D., (405) (Dys.)
Dinger, J. E., 486 (Y.F.)
——, Schüffner, W. A. P., Snijders, E. P. & Swellengrebel, N. H., 485, 486, 869, 870 (Y.F.)
Dinulescu, G., 317 *bis* (Z.)
Dios, R., Werngren, E. T. & Perez, P., 842 (S.S.)
Dixey, M. B. D., 995 (Lep.)
Dixon, D. S., with Low, 1024 (Sp.)
Dizon, E. Y., 1000 (Lep.)
Djaparidse, P., 774 (Pel.)
Dobell, C., with Bishop, A., 389 (Am.)
Dobrovolskaia-Zavadskaia, N. & Kobozieff, N., 984 (Hel.)
Doerr, R. & Schmidt, G. W., 980 (Hel.)
Dolloff, A. F., 927 (Z.)
Donaldson, R. S., 326 (Lep.)
Donath, W. F., with Jansen, 764 (Bb.)
Donatien, A., with Sergent, Edm., Parrot & Lestoquard, 289 (Z.)
Donayre, A., 890 (Z.)
Donnison, C. P., 73, 162 (Misc.)
Donomae, I., 126 (Lept.)
Doorenbos, W., 730, 737 (Pl.)
Doornbos, W. H., with Swellengrebel, 302 (Z.)
Dorogan, D. & Capri, M., 777 (Pel.)
Dostrowsky, A., 101 (K.A.), 774 (Pel.)
Doubrow, with Garin & Mounier, 414, 428 (Hel.)
Dougherty, M. S., 780 (Am.)
Dove, W. E., with White, 426 (Hel.)
Dover, C., 904 (Z.)
Dracoulidès, N., 142 (Fev.)
van Driel, B. M., 595 (Misc.)
Duboccage, 592 (Misc.)
Dubois, A., 822, 829 (S.S.)
Dubrowinski, S. B., Kranzfeld, A. M., Rosenfeld, W. D. & Salamandra, E. G., 415, 442 (Hel.)
Dudley, S. F., with MacArthur & Whittingham, 148, (556) (Fev.)
Duffau, 131 (Und.)
Duggan, J. N., 25 (Oph.)
Duhig, J. V., 361 (Z.)
Duke, H. L., 846, 847 (S.S.)
Dukelsky, O. & Golubewa, E., 469 (Hel.)
Duncan, J. T., 538 (Und.)
Dunn, C. L., (21) (Chl.)
—— & Khan, S., 14 (Chl.)
Dunn, L. H., 293 (Z.)
Dunn, T. B., 378 (Am.)
Durand, P., with Nicolle & Conseil, 735 (Pl.)
Duren, 580, 581 (Misc.)
Durieux, C. & Sall, M., 192 (Mal.)
Duval, C. W., with Castellani, (530) (Der.)
Dwijkoff, P. P. & Bogoslowskij, W. N., 253 (Rab.)
Dyar, H. G., 312 (Z.)

E

Eades, T., with Kellaway, 355 (Z.)
Eddie, B., with Meyer, 545, 546 (Und.)
Edwards, F. W., 309, 311 (Z.)
——, with Paine, 301 (Z.)
Egypt, 366 (Lab.)
Eidinow, A., 934 (Z.)
Eisenberg, with Ruge, Lohfeldt, Knabe & Kunert, 214 (Mal.)
Eisenklam, I., 967 (Hel.)
Ejercito, A., 217, (220) (Mal.)
Ekblom, T., 310 (Z.)
Eliseo Montaña, (342) (Lep.)
Ellenbogen, V., with Giemsa, 837 (S.S.)
Ellett, E. C. & Rychener, R. O., 27 (Oph.)

Ellingworth, S., with Browning, Cohen & Gulbransen, 235 (S.S.)
Elliot, R. H., 504 (Oph.)
Ellis, R. W. B., 776 (Pel.)
Elmes, B. G. T., with Connal, Paisley & Bowrey, 9 (Pl.)
Emile-Weil, P., with Grégoire, 71 (Misc.)
Emily, J., 882 (Z.)
Engineering News Record, 925 (Z.)
Engler, A., with Launoy, 832 *bis* (S.S.)
Epaulard, A., Hornus, P. P. & Delpy, J. J. P., 39 (Misc.)
Epstein, H. & Tarassow, S., 119 (Lept.)
Eristawi, K., 473 (Hel.)
Escalar, G., with Pecori, 195 (Mal.)
Escomel, E., 152 (Fev.), 1031, 1032 (B.R.)
Essex, H. E., with Feldman, 454 (Hel.)
—— & Markowitz, J., 932 *bis* (Z.)
Estival, G., 935 (Z.)
Eubanas, F., 333, 679, 1002 (Lep.)
Eustatziu, G. & Ionesco, V., 660 (Mal.)
Evans, A. M., 307 (Z.), 485 (Y.F.)
——, with Patton, 177 (B.R.)
Eykman, C., 83 (Misc.)

F

Fabre, H. J. A., 441 (Hel.)
Fabre, J. A., 591 (Misc.)
Fairley, K. D. & Fairley, N. H., 454 (Hel.)
——, —— & Williams, F. E., 470 (Hel.)
Fairley, N. H., 1018 (Sp.)
——, with Fairley, K. D., 454 (Hel.)
—— & Jasudasan, F., 351 (Sp.)
——, with Kellaway & Williams, 970 (Hel.)
——, with Mackie & Staff of the Haffkine Institute, 343 (Sp.)
Falleroni, D., 196 (Mal.)
Famulari, S., (474) (Hel.)
Fanano, V., 98 (K.A.)
Far Eastern Association of Tropical Medicine, 179 (Mal.), 326 (Lep.), 608 (K.A.), 728 (Pl.), 756 (Bb.), 897 (Z.)
Fasiani, G. M. & Oselladore, G., 534 (Myc.)
Faust, E. C., 265 (B.R.), 301, 883, 886, 894 (Z.), 780 (Am.), 967 *bis* (Hel.)
——, Campbell, H. E. & Kellogg, C. R., (993) (Hel.)
—— & Maxwell, T. A., 920 (Z.)
Favia, N., with Dechigi-Declich, 135 (Und.)
Favilli, G., 132, 547 (Und.)
Federated Malay States, 193, 194 (Mal.), 372 (Lab.)
Feegrade, E. S., 299, 306 (Z.)
Feldman, W. H. & Essex, H. E., 454 (Hel.)
Ferguson, A. L., with Pirie & Retief, 427 (Hel.)
Ferguson, H. R. M., 1014 (Oph.)
Fermi, C., 258, 259 (Rab.)
Fernandez, F. M., (600) (Misc.)
Fernandez, G., with Velasco, Alonso, Limkako & Del Rosario, 334 (Lep.)
Fernandez, J. M. M., with Fidanza & Schujman, 680 (Lep.)
Ferrão, P., 206 (Mal.)
Ferrari, A., (937) (Z.)
Ferruccio, C. R., with Siro, 671 (Lep.)
Fialho, with de Mello, (117) (R.F.)
Fialho, A., with Jakob & Villela, 869 (Y.F.)
——, with Pacheco, 404 (Dys.)
Fichera, S. & Maugeri, F., 550 (Und.)
Fidanza, E. P., Fernandez, J. M. M. & Schujman, S., 680 (Lep.)
Figueiredo, B., with Penna, 477, 868 (Y.F.)
Fiji Annual Medical and Health Report, 678 (Lep.)
Findlay, G. M., 1029 (B.R.)
——, with Hindle, 872 (Y.F.)
Fine, J., with Blacklock & Gordon, 880 (Z.)
Finkelstein, M. H., 858 (Chl.)
Finocchio, M., with Volpino, 750 (Rab.)
Fiorentini, A., 210 (Mal.), 616 (K.A.)
Fischer, O. & Kunert, H., 828 (S.S.)
Fischer, W. O., 428 (Hel.), 586 (Misc.)
—— & Orenstein, A. J., 408 (Hel.)
Fischl, V., 128 (R.B.F.), 836 (S.S.)
—— & Kussat, E., 852 (S.S.)
Fitzgerald, R. D., (993) (Hel.)
Fitzpatrick, S. C., 968 (Hel.)
Florentin, P., with de Lavergne, 126 (Lept.)
Flu, P. C., 6, 7, 736 *ter*, 737 (Pl.), 53 (Misc.), 468 (Hel.)
Foley, H. & Parrot, L., 323 (Z.)
Fonquernie, 1 (Pl.)
de Fonseca, F., 97 (K.A.)
da Fonseca, O. & Leão, A. E. de A., 519 *bis* (Der.)
Fontes, P., 329 (Lep.)
Fontoynont & Razafindralambo, 799 (Dys.)
Fornara, L., with Schwetz, 852 (S.S.)
——, with —— & Collart, 731 (Pl.)
Fournier, A., with Vigne, 102 (K.A.)
Fox, H., 513 (Der.), 713 (Y. & S.)
Fox, L. W., 23 (Oph.)
Franchini, G., 167 (Misc.), 324 *bis*, 925 (Z.), (405) (Dys.), 435 (B.R.), 683 (Lep.)
Frank, A. W., 658 (Mal.)
Fraser, A. M. & Smith, J., 793 (Dys.)
——, with ——, 793 (Dys.)
Fraser, L., 360 (Z.)
Frazier, C. N. & Chen, F., 1002 (Lep.)
Freeman, L. B., 275 (Z.)
Freeman, M., with Kellaway & Williams, 933 (Z.)
Frei, W., 726, 727 (C.Bu.)
de Freitas, H. B., 262 (Rab.)
Frew, H. W. O., with Pratt, 792 (Dys.)
Frew, J. G. H., 313 (Z.)
Frèze, with Garnaudier, 555 (Fev.)
Friede, K. A., with Kritschewski, 578 (Misc.)
Friedrichs, A. V. & Harris, W. H., 390 (Am.)
——, with ——, 391 (Am.)
Frobisher, M., Jr., 493 (Y.F.)
——, with Sawyer, 494 (Y.F.)
——, with ——, Kitchen, & Lloyd, 487 (Y.F.)
Fróes, H. P., 468 *ter* (Hel.)
Froment, R., with Nicolas & Lacassagne, 775 (Pel.)
Fujitsuna, S., 857 (Chl.)
Fülleborn, F., 407, 425, 470 (Hel.)
—— & Kikuth, W., 956 *bis* (Hel.)
Furuyama, T., with Kobayashi & Chiba, 439 (Hel.)

G

Gabaldón, A., 277, 884 (Z.)
Gabbi, U., *et al*, 1031 (B.R.)
Gaisky, N. A., 5 (Pl.)
Galliard, H., 246 *bis*, 841 *bis* (S.S.)

Gallinato, V., with Demaria, 918 (Z.)
Galstaun, S. G., 163 (Misc.)
Gamble, W. G., Jr., 441 (Hel.)
Ganora, R., 593 (Misc.)
Gantt, V. C. & Ponomarev, A. V., 749 (Rab.)
Gantt, W. H. & Ponomarew, A. W., 255 (Rab.)
Garcia, F., with von Oettingen, 957 (Hel.)
Garcia, O., 717 (Y. & S.)
Garcia Espín, J., (405) (Dys.)
Gardner, G., 116 (R.F.)
Gardner, S. M., with Lincoln, 535 (Myc.)
Garfinkle, F. E., with Stanley & Goddard, 794 (Dys.)
Garin, C., 139 (Fev.), 665 (Mal.)
——, Doubrow & Mounier, 414, 428 (Hel.)
Garnaudier & Frèze, 555 (Fev.)
Garnham, P. C. C., 191 (Mal.)
Gasperini, C. G., (148) (Fev.), (600) (Misc.), (937) (Z.)
Gastaminza, U., 523 (Der.)
Gaston, Olmer, J. & Amédéo, 393 (Am.)
Gater, B. A. R. & Rajamoney, P. D., 303, 305 (Z.)
Gatschetschiladse, J., 774 (Pel.)
Gatti, C., with Delamare, 520, 522 (Der.)
Gaud, M., 734 (Pl.)
Gaulene, with Mesnard & Joyeux, 566 (Misc.)
Geiger, A., with Kligler & Comaroff, 241 (S.S.)
Gemar, F., 392 (Am.)
Gendre, E., with Joyeux & Baer, (993) (Hel.)
Geneeskundig Tijdschrift voor Nederlandsch-Indië, 373, 374, 945 (Lab.)
Genevray, J., 955 (Hel.)
George, P. V., with King, Iyer & Natarajan, 319 (Z.)
——, with Pandit, Mankikar & Natarajan, 917 (Z.)
Georgiewsky, A., 96 (K.A.)
Ghetti, G., (117) (R.F.)
Ghosh, B., with Sur, S. N., 190 (Mal.)
Ghosh, H., 795 (Dys.)
Ghosh, N. N., with Chopra & Ratnagiriswaran, 65 (Misc.)
Ghosh, S., with Chopra, 65, 568 (Misc.)
Gibson, A. G., 690 (B.R.)
Giemsa, G., 832 (S.S.)
—— & Ellenbogen, V., 837 (S.S.)
Giglioli, G., 508 (B.R.), 525 (Der.), 564 *bis* (Misc.)
Gill, C. A., 180, 634 (Mal.)
Gill, C. W. H., 810, 823 (S.S.)
Ginsburg, J. M., 582 (Misc.)
——, with Peterson, 926 (Z.)
Giordano, A. S., 539 (Und.)
—— & Sensenich, R. L., 539 (Und.)
Giordano, M., 840 (S.S.), 862 (B.R.)
Gioseffi, M., 927 (Z.)
Girand, with Pinard, Rabut & Abricosoff, 341 (Lep.)
Girges, R., 462 *quat.* (Hel.)
Glaser, R. W. & Coria, N. A., 886 (Z.)
Gley, P., with Richet, 232 (S.S.)
Gloster, T. H., Beer, W. A., Nambiar, M. R. & Sastry, S. S., 259 (Rab.)
Glusmann, M. P., Predtetschenskaja, L. A. & Ssolowjewa, J. W., 747 (Rab.)
Gnanadikam, G. J., 29 (Oph.)
Goco, E., 596 (Misc.)
Godal, J., 599 (Misc.)
Goddard, W. P., with Stanley & Garfinkle, 794 (Dys.)
Godwin, D. E., 28 (Oph.)
Goeckerman, W. H., Osterberg, A. E. & Sheard, C., 529 (Der.)
Goelam, 595 (Misc.)
Gokhale, S. K., with Sokhey, 343 (Sp.)
Goldberger, J. & Wheeler, G. A., 776 (Pel.)
Gold Coast, 363, 942 (Lab.), 716 *bis* (Y. & S.), 995 *bis* (Lep.)
Golden, R., with O'Connor & Auchincloss, 986 (Hel.)
Goldenberg, J., with Tzekhnovitzer, 252, 749 (Rab.)
Goldie, H., 116 (R.F.), 403 (Dys.), 651, 659 (Mal.)
Golow, D., with Iwanowsky, 739 (Pl.)
Golubewa, E., with Dukelsky, 469 (Hel.)
Gomes, J. M., 338, 683 (Lep.)
—— & Antunes, P. C. de A., 1005 *bis* (Lep.)
Gomes, L. S., 494 (Y.F.)
——, with de Castro, 333 (Lep.)
Gomes, L. de S., with Piza, 703 (Lept.)
González, E., 328 (Lep.)
Goodale, R. H. & Krischner, H., 471 (Hel.)
van Goor, J. M. N., 889 (Z.)
Gordadse, G. & Kamalow, N., 443 (Hel.)
Gordon, A. K., 70 (Misc.)
Gordon, R. M. & Aidin, R., 813 (S.S.)
——, with Blacklock & Fine, 880 (Z.)
—— & Davey, T. H., 813 (S.S.)
—— & Macdonald, G., 643 (Mal.)
Gori, P., with Manieri, (117) (R.F.)
Govindaradjassamy, with Labernadie, 1011 (Lep.)
Goyle, (10) (Pl.)
Grabow, C. & Struwe, F., 128 (R.B.F.)
Gracey, D. I., 727 (C.Bu.)
Graf, H., 225 (S.S.)
Graham, J. D. (10) (Pl.), 638 (Mal.)
Graham-Smith, G. S., 913 (Z.)
Gray, J. D. A., 112 (R.F.)
Gray, S. B. D., 65 (Misc.)
Green, R., 194, 203, 654 (Mal.)
Greene, W. P., with Christenson, 459 (Hel.)
Greenway, D. F., 861 (B.R.)
Gregg, A. L., with Bertwistle, 75 (Misc.)
Grégoire, R. & Emile-Weil, P., 71 (Misc.)
Gridnewa, W. M., 275 (Z.)
Gritti, P., with Califano, 854 (S.S.)
Groot, K. P., 165 (Misc.)
Gross, R. D., 216 (Mal.)
Grossi, G. & Balog, P., 532 (Myc.)
——, with Balog, 531 (Myc.)
Grund, J. L., 526 (Der.)
Gubarew, E., with Iwanowsky & Golow, 739 (Pl.)
Gubbay, R., 501 (Oph.)
Gudger, E. W., 936 (Z.)
Guédé, M., with Sézary & Dérot, 336 (Lep.)
Guerin & Mattlet, 158 (Misc.)
Guerra Méndez, R., (220) (Mal.)
Guerrero, G. R., 328 (Lep.)
Guha Thakurta, S. R., with Ukil, 857 (Chl.)
Guillamon, A., 413 (Hel.)
Guillerm, J., 762 (Bb.)
Gulbransen, R., with Browning, Cohen & Ellingworth, 235 (S.S.)
van Gulik, P. J., 467 (Hel.)

Gunn, J. A., 67 (Misc.)
Gupta, B. M. D., 609 (K.A.)
——, with Knowles & Acton, 59 (Misc.)
——, with —— & Basu, 110 (R.F.)
Gupta, C. R. D., (220) (Mal.)
——, with Napier, 607 (K.A.)
Gupta, J. C., with Chopra & Basu, 611 (K.A.)
Gupta, J. D., 15 (Chl.)
Gupta, J. M. D., with Brahmachari, Banerjea & Basu, 613 (K.A.)
Gupta, S. C. S., (220) (Mal.)
Guthrie, R. H., 769 (Pel.)
Gutmann, L., 752 (Rab.)
Gwéléssiany, J., 280 (Z.)

H

Haga, J., (937) (Z.)
——, with Brug, van Joost & Verbunt, 1009 (Lep.)
Hahn, M. & Hirsch, J., 18 (Chl.)
Hakki, I., 884 (Z.)
Haldar, K. C., with Napier, 92 (K.A.)
Hall, M. C. & Augustine, D. L., 420 (Hel.)
Hallman, E. T., with Huddleson, 544 (Und.)
Hamerton, A. E., 49 (Misc.)
Hamet, H., 1024 (Sp.)
Hamlyn-Harris, R., 581 (Misc.)
Hampil, B., with Damon, 122 (Lept.)
Hance, J. B., 1021 (Sp.)
Hardy, A. V., Hudson, M. G. & Jordan, C. F., 543 (Und.)
Harkness, A. H., 67 (Misc.)
Harper, J., 463 (Hel.)
Harris, D. L., 257 (Rab.)
Harris, S. T., 317 (Z.)
Harris, W. H. & Friedrichs, A. V., 391 (Am.)
——, with ——, 390 (Am.)
Hartmann, E., 851 (S.S.)
Harvey, D., 854 (S.S.)
Hase, A., 920 (Z.)
Hashiguchi, 719, 720 (Y. & S.)
Haslam, J. F. C., 173, 266 (B.R.), 590 (Misc.)
Hassanein, M. A., with Schütze, 8 (Pl.)
Hasselmann, C. M. & Hasselmann-Kahlert, M., 208 (Mal.)
Hasselmann-Kahlert, M., with Hasselmann, 208 (Mal.)
Hassler, E., (474) (Hel.)
Hatt, P., 697 (R.F.)
Häupl, C., 676 (Lep.)
Hawe, A. J., 716 (Y. & S.)
Hawley, H., with Megaw, 572 (Misc.)
Hay, H. R., 394, 792 (Dys.)
Hayes, T. H., 902 (Z.), 997 (Lep.)
Health, Melbourne, 159 (Misc.)
Hecht, O., 294, 309, 897, 912, (937) (Z.)
Hecht-Eleda, M., 661 (Mal.)
Hegglin, O., 977 (Hel.)
Hegler, C., 540 (Und.)
Hegner, R., 271, 276 (Z.)
—— & Schumaker, E., 273 (Z.)
Heinemann, 63 (Misc.)
Hellerström, S., 433 (B.R.), 726, 727 (C.Bu.)
Helmy, M., with Augustine & Nazmi, 409 (Hel.)
Henderson, J. M., 326, 674 (Lep.)
Henriques, J. F., 978 (Hel.)
Henry, A. F. X., 211 (Mal.)
Henry, E., 35 (Misc.)
Herbert, H., 1014 (Oph.)
d'Herelle, F., 558 (Misc.), 602 (B.R.), 728 (Pl.)
——, Malone, R. H. & Lahiri, M. N., 558 *bis* (Misc.), 1026 (B.R.)
Herivaux, A., 799 (Dys.)
Hermans, E. H., 725 (C.Bu.)
Hermant, P. & Cilento, R. W., 1026 (B.R.)
Hermitte, L. C. D., 154 (Misc.)
Hernandez, L. G., with Morales-Otero, 1008 (Lep.)
Hernandez Pacheco, D., 413 (Hel.)
—— & Pastor Botija, F., 444 (Hel.)
Herrmann, O., 263 (Rab.)
—— & Korobkina, W., 653 (Mal.)
—— & Lifschitz, M., 650 (Mal.)
Hertig, M. & Huang, T. F., 321 (Z.)
——, with Young, 608, 611 (K.A.)
——, with —— & Liu, 94 (K.A.)
Herzberg, K., with Manteufel, 877 (Y.F.)
Hetherington, H. B. & Steenson, K. R., 169 (Misc.)
Heyd, C. G. & Sheplar, A. E., 781 (Am.)
Higgins, M. E., 50 (Misc.)
Hilgers, P., 397 (Dys.)
Hill, R. B., 412 (Hel.)
Hindle, E., 49 (Misc.), 495, 497 (Y.F.), 888 (Z.)
—— & Findlay, G. M., 872 (Y.F.)
Hinman, E. H., with Matheson, 298, 901 (Z.)
Hinshaw, H. C., 273 (Z.)
Hirsch, J., with Hahn, 18 (Chl.)
Hirschfelder, A. D. & Wright, H. N., 234 (S.S.)
——, with ——, 836 (S.S.)
Hirst, L. F., with Vadivelu, K., 319 (Z.)
Hoare, C. A., 282 (Z.)
Hoeppli, R., 447, (474) (Hel.), 618 (K.A.), 726 *bis* (C.Bu.)
——, Hsü, H. F. & Wu, H. W., 176 (B.R.)
—— & Regendanz, P., 850 (S.S.)
——, with ——, 225 (S.S.)
Hoesch, K., 118 (Lept.)
Hoffman, A. M., 134 (Und.)
Hoffman, W. A. & Rivera, T., 452 (Hel.)
Hoffmann, C. C., 899 (Z.), 991, 992 (Hel.)
Hoffmann, W. H., 505, 1015 (Oph.), 937 (Z.), 1001 (Lep.)
—— & Baez, P. R., 1000 (Lep.)
Hoflin, J. W., 193 (Mal.)
Hofstee, H. G., 62 (Misc.)
Hogarth, A. M., 88 (B.R.)
Hohenadel, B., with Kuczynski, 478, 877 (Y.F.)
——, with —— & MacClure, 481 *bis*, 482 (Y.F.)
Holm, P., with Kristensen, 131 (Und.)
Holmes, W. H. & Starr, P., 347 (Sp.)
Hoolboom, L. E., 515 (Der.)
Hooper, D., 210 (Mal.)
Hooton, A., 600 (Misc.)
Hopkins, R., Denney, O. E. & Johansen, F. A., 676 (Lep.)
——, with —— & ——, 673 (Lep.)
Horn, L. & Kauders, O., 215 (Mal.)
Hornus, P. P., with Epaulard & Delpy, 39 (Misc.)
——, with Nicolle & Anderson, 106 (R.F.)
Horta, P. de F. P., 518 (Der.)
Hosoya, S., with Stefanopoulo, 706 (Lept.)
Howard, A., 113 (R.F.)

Howells, W. M., 171 (Misc.)
Howland, L. J., 901 (Z.)
——, with Beattie, 296 (Z.)
Hsü, H. F., with Hoeppli & Wu, 176 (B.R.)
Hu, C. H. & Cash, J. R., 610 *bis* (K.A.)
——, with ——, 609, 610 (K.A.)
—— & Mu, J., 1007 (Lep.)
Huang, T. F., with Hertig, 321 (Z.)
Huddleson, I. F. & Hallman, E. T., 544 (Und.)
Hudson, M. G., with Hardy & Jordan, 543 (Und.)
Hudson, N. P., with Bauer, 866 (Y.F.)
—— & Philip, C. B., 489 (Y.F.)
Huff, C. G., 310, 892 (Z.)
Hughes, T. A. & Shrivastava, D. L., 652 (Mal.)
Huie, D., with Mu, 97 (K.A.)
Huinink, A. M. S. B., with Schuurman, 582 (Misc.), 893 (Z.)
Huisman, B., 506 (Oph.)
Huizinga, L. S., 331, 332 (Lep.)
Hull, T. G., 262 (Rab.)
Huppenbauer, C. B., 666 (Mal.)
Hurwitz, E., 997 (Lep.)
Husain, M. A., 66 (Misc.)

I

Iacono, I., 798 (Dys.)
Ibrahim, A. B., 170 (Misc.)
Ichok, G., 500 (Y.F.)
Igersheimer & Bodenheimer, E., 111 (R.F.)
Ignatiev, A. K. & Molodzova, P. F., 320 (Z.)
Iimura, I., 11 (Chl.)
Iimura, Y., 2, 5 (Pl.)
Imms, A. D., 293 (Z.)
Imschenetzky, A., 529 (Der.)
Indian Medical Gazette, 188 (Mal.)
International Labour Review, 584 (Misc.)
Ioff, I., 661 (Mal.), 919 (Z.)
Ionesco, V., with Eustatziu, 660 (Mal.)
Ionnesco, D. & Teodosiu, T., 253 (Rab.)
Isabolinski, M. P. & Zeitlin, A. J., 255 (Rab.)
Ishii, S., 453 (Hel.)
Ishikawa, S., 318 (Z.), 440 (Hel.), (803) (Dys.)
Itabashi, K., 755 (Rab.)
Iwanowsky, N., Gubarew, E. & Golow, D., 739 (Pl.)
Iyengar, K. R. K., 750 (Rab.)
Iyengar, M. O. T., 181 (Mal.), 307, 897, 898, 907, 908, (937) (Z.)
—— & Sur, P., 205 (Mal.)
Iyer, M. A. K., 130 (R.B.F.)
Iyer, P. V. S., with King, Natarajan & George, 319 (Z.)
——, with Pandit, S. R. & Pandit, C. G., 989 (Hel.)

J

Jackson, D., 359 (Z.)
Jackson, L. E., 925 (Z.)
Jacocks, W. P., 410 (Hel.), 583 (Misc.)
Jadassohn, W., 976 (Hel.)
Jahnel, F. & Pentschew, A., 700 (R.F.)
Jakimow, W. P., 111 (R.F.)
Jakob, A., Fialho, A. & Villela, E. L., 869 (Y.F.)
Jamaica, 591 (Misc.)
James, S. P., 179, 190, 626, 631, 663 *bis* (Mal.)
—— & Kauntze, W. H., 665 (Mal.)
——, Nicol, W. D. & Shute, P. G., 181, 183 (Mal.)
Jamot, E., 219 (Mal.), 222, 249 (S.S.)
—— & Chambon, 825 (S.S.)
Jansen, B. C. P. & Donath, W. F., 764 (Bb.)
Jantzen, W., 757 (Bb.)
Jasudasan, F., with Fairley, 351 (Sp.)
Jettmar, H. M., with Wu Lien-Teh, Pollitzer & Chia-Swee, 2 (Pl.)
Jimenez, C. M., 523 (Der.)
Jírovec, O., (937) (Z.)
Joannidès, G., with Blanc & Pangalos, 1005 (Lep.)
——, with Kondoleon, 143 (Fev.)
Johansen, F. A., with Denney & Hopkins, 673, 676 (Lep.)
——, with Hopkins & Denney, 677 (Lep.)
Johns, F. M., 779 (Am.)
—— & Tripoli, C. J., 380 (Am.)
Johnson, W. B. & Lloyd, L., 811 (S.S.)
Johnsson, V., (551) (Und.)
Jolly, G. G. (600) (Misc.)
Jolly, G., da Costa, J. J. G. & Shoung, A., 856 (Chl.)
Jones, P. H. & Turner, R. H., 388 (Am.)
van Joost, R. P. A. C., with Brug, Haga, & Verbunt, 1009 (Lep.)
Jordan, C. F., with Hardy & Hudson, 543 (Und.)
Jorge, R., 140 (Fev.), (879) (Y.F.)
Jourdran, E., 11 (Chl.)
Journal of the Medical Association of South Africa, 466 (Hel.)
Joyeux, B., with Bablet, 745 (Rab.)
——, with Mesnard & Gaulene, 566 (Misc.)
Joyeux, C., 105 (K.A.)
—— & Baer, J. G., 964 (Hel.)
——, Gendre, E. & Baer, J. G. (993) (Hel.)
Judd, J. H., 505 (Oph.)
Jung, J. S., with Naidu, 6, 728 (Pl.)
Jung, S., with Naidu & Kamakaka, 740 (Pl.)
Junior, M. da R., 395 (Dys.)
Jurukoff, B., with Regendanz, 844 (S.S.)
Justin-Besançon, L., with Labbé and Nepveux, 278 (Z.)

K

Kadletz, N. A. & Kusmina, L. A., 304 (Z.)
Kagaya, K., 122, 123 (Lept.)
Kairis, Z., 144 (Fev.)
Kaiser, L., 904 (Z.), 998 (Lep.)
Kaktin, A., with Weidemann, 329 (Lep.)
Kalina, G., 4 (Pl.)
Kamakaka, K. H., with Naidu & Jung, 740 (Pl.)
Kamalow, N., with Gordadse, 443 (Hel.)
Kamat, D. D. & Ranadive, V. Y., 326 (Lep.)
Kandelaki, S., 148 (Fev.)
Karamchandani, P. V., 622 (K.A.), 657 (Mal.)
Kasakow, P. T., 966 (Hel.)
Kasauli, Pasteur Inst. of India, 750 (Rab.)
Kassirsky, J. A., 351 (Sp.)
Katahira, J., 287 *bis* (Z.)
Kauders, O., with Horn, 215 (Mal.)
Kaufman, J. B., 755 (Rab.)

Kauntze, W. H., 365 (Lab.)
——, with James, 665 (Mal.)
Kawamura, R., 464 (Hel.)
Kawanishi, K., 427 (Hel.)
Käyser, J. D., 602 (B.R.)
Keefer, C. S., 763 (Bb.)
——, Khaw, O. K. & Yang, C. S., 614 (K.A.)
Keilin, D. & Nuttall, G. H. F., 921 (Z.)
Kellaway, C. H., 355, 356 *bis*, 929, 935 (Z.), 451 (Hel.)
—— & Eades, T., 355 (Z.)
——, Fairley, N. H. & Williams, F. E., 970 (Hel.)
——, Freeman, M. & Williams, F. E., 933 (Z.)
—— & Williams, F. E., 356 (Z.)
Kellogg, C. R., with Faust & Campbell, (993) (Hel.)
Kendrick, J. F., 420 (Hel.)
Kenya, 365 (Lab.)
Kessel, J. F. & Mason, V. R., 800 (Dys.)
Kessler, A., (474) (Hel.)
Kesten, B. M., 513 (Der.)
Khaiat, H., with Trabaud & Sabbagh, 394 (Dys.)
Khaled, Z., 404 (Dys.)
Khalil, M. & Betache, M. H., 460 (Hel.)
—— & Salah El Din, M., 963 (Hel.)
Khan, B. M., 307 (Z.)
Khan, S., 16 *bis* (Chl.)
—— & Agarwal, M. N., 20 (Chl.)
——, with Dunn, 14 (Chl.)
Khandehar, K. G., (530) (Der.)
Khaw, O. K., 975 (Hel.)
——, with Keefer & Yang, 614 (K.A.)
Khouri, J., 382 (Am.), 458 *bis* (Hel.)
Khoury, J., 783 (Am.)
Kikuth, W., with Fülleborn, 956 *bis* (Hel.)
—— & Regendanz, P., 579 (Misc.)
King, C. H., with Barber, 217 (Mal.)
King, G., with Pillat, 25 (Oph.)
King, H. H., 369 (Lab.)
——, Iyer, P. V. S., Natarajan, N. & George, P. V., 319 (Z.)
King, W. G., 634 (Mal.)
King, W. V., 200, 201 (Mal.)
Kingsbury, A. N., 126 (Lept.)
Kipschidse, N., 966 (Hel.)
Kipchidzé, N., 891 (Z.)
——, with Deschiens, 277 (Z.), 791 (Am.)
Kiribayashi, S., 11 (Chl.)
Kirschfeld, E. P., 330 *bis* (Lep.)
Kirwan, E. O'G., 28 (Oph.)
Kirwan, E. W. O'G., 503, 505 (Oph.)
Kitchen, S. F., with Cowdry, 475 (Y.F.)
——, with Sawyer, Frobisher, Jr. & Lloyd, 487 (Y.F.)
Kleine, F. K. & Kroó, H., 558 (Misc.)
Kligler, I. J., 147, 554 (Fev.), 240 (S.S.), 601 (B.R.)
—, Geiger, A. & Comaroff, R., 241 (S.S.)
Klotz, O., 200 (Mal.)
Knabe, with Ruge, Lohfeldt, Eisenberg & Kunert, 214 (Mal.)
Knap, C. R., 986 (Hel.)
Knowles, R., 608 (K.A.), 635 (Mal.), (937) (Z.)
——, Acton, H. W. & Gupta, B. M. D., 59 (Misc.)
——, Gupta, B. M. D. & Basu, B. C., 110 (R.F.)
Knutti, R. E., 253 (Rab.)
Kobayashi, H., 898 (Z.)
——, Chiba, E. & Furuyama, T., 439 (Hel.)
Kobayashi, T., 416 (Hel.)
Kobozieff, N., with Dobrovolskaia-Zavadskaia, 984 (Hel.)
Koch, J., 254 (Rab.)
Koike, T., 339, 685 (Lep.)
Kokoris, D., 143 (Fev.)
Komp, W. H. W., with Barber, 198, 199 *bis* (Mal.), 303 (Z.)
——, with —— & Newman, 188 (Mal.)
Kondo, S. & Obana, K., 749 (Rab.)
Kondoleon, E. & Joannides, G., 143 (Fev.)
Konrich, F., 856 (Chl.)
Konstansoff, S. W., 663 (Mal.)
Kopciowska, L., with Nicolau, 251 (Rab.)
Koppel, A., 727 (C.Bu.)
Kopstein, F., 360 *bis* (Z.)
Korke, V. T., 987 (Hel.)
Korobkina, W., with Herrmann, 653 (Mal.)
Korobkova, E., 739 (Pl.)
Korostelew, W. E., (600) (Misc.)
Kortenhaus, F., 446 (Hel.)
Korteweg, P. C., 648 (Mal.)
——, with Schüffner & Swellengrebel, 648 *bis* (Mal.)
Kouwenaar, W., 54 (Misc.), 375 (Lab.)
—— & Wolff, J. W., 707 (Lept.)
Kranzfeld, A. M., with Dubrowinski, Rosenfeld & Salamandra, 415, 442 (Hel.)
Krause, M., with Collier, 232, 835 (S.S.)
Krischner, H., with Goodale, 471 (Hel.)
Krishnamurty, C., 402 (Dys.)
Kristensen, M. & Holm, P., 131 (Und.)
Kritschewski, I. L., Baskin, M. M. & Lebedjeva, M. N., 578 (Misc.)
—— & Friede, K. A., 578 (Misc.)
—— & Rubinstein, P. L., 577 (Misc.)
—— & Schapiro, S. L., 578 (Misc.)
Kroó, H., with Kleine, 558 (Misc.)
Krouch, M., with Villain, (220) (Mal.)
Krukow, A. N., 958 (Hel.)
Kuczynski, 480 (Y.F.)
Kuczynski, M. H., 86 (B.R.)
—— & Hohenadel, B., 478, 877 (Y.F.)
——, —— & MacClure, E., 481 *bis*, 482 (Y.F.)
Kudo, R., 289, 894 (Z.)
Kumm, H. W., 302 (Z.)
Kunert, H., with Fischer, 828 (S.S.)
Kunert, with Ruge, Lohfeldt, Knabe & Eisenberg, 214 (Mal.)
Kurauchi, K., 732 (Pl.), 883 (Z.)
Kurotchkin, T. J., & Chu, C. K., 532 (Myc.)
Kusmina, L. A., with Kadletz, 304 (Z.)
Kussat, E., with Fischl, 852 (S.S.)
Ku Yue Chi, (993) (Hel.)
Kyriasidis, K. N., 144 (Fev.)
Kyriazides, N., 144 (Fev.)

L

Labbé, M., Nepveux, F. & Justin-Besançon, L., 278 (Z.)
Labernadie, V., 335, 999, 1004 (Lep.), 450 (Hel.)
——, with André, 617 (K.A.)
——, with Aubin, 999 (Lep.)
—— & Govindaradjassamy, 1011 (Oph.)

Labernadie, V. & Marneffe, H., 441 (Hel.)
—— & Srinivassane, 1009 (Lep.)
Labernadie, V. G. F., 155 (Misc.)
——, with Borel, 311 (Z.)
Labranca, A., (220) (Mal.)
Lacassagne, with Nicolas & Froment, 775 (Pel.)
La Face, L., 302 (Z.)
Laffont, Binet & Lesini, 662 (Mal.)
Lahiri, B. N., with Cunningham & Nicholas, 746 (Rab.)
Lahiri, M. N., with Malone & d'Herelle, 1026 (B.R.)
Lahiry, M. N., with d'Herelle & Malone, 558 *bis* (Misc.)
Laigret, J., 992 (Hel.)
Lal, N., 932 (Z.)
Lallemant, M. A., 411 (Hel.)
Lambert, S. M., 57 (Misc.), 710 (Y. & S.)
Lamborn, W. A., 294 (Z.)
Lampe, P. H. J., 332 (Lep.)
—— & Simons, C., 672 (Lep.)
Lamson, P. D., Robbins, B. H. & Ward, C. B., 418 (Hel.)
——, Ward, C. B. & Brown, H. W., 977 (Hel.)
Landron, F., with Weiss, 350 (Sp.)
——, with ——, Costa-Mandry & Wilkes-Weiss, 353 (Sp.)
Lang, M. C., 1004 (Lep.)
Langeron, J., with van Nitsen, (406) (Dys.)
Langeron, M., 517, 520, 523 (Der.)
de Langibaudière, B. & Than-Trong-Phuoc, 785 (Am.)
Lanzoni, A., 39 (Misc.)
Lara, C. B., 334 (Lep.)
—— & Nicolas, C., 334 (Lep.)
——, with de Vera, 335 (Lep.)
Large, D. T. M., 401 (Dys.)
Larsen, A. M., 755 (Rab.)
Lasnet, 1, 2 (Pl.), 11 (Chl.)
Lathbury, E. B., (937) (Z.)
Latyschew, N. I., 646 (Mal.)
Launoy, L. & Engler, A., 832 *bis* (S.S.)
——, Nicolle, P. & Prieur, M., 231, 834 (S.S.)
—— & Prieur, M., 833 *bis* (S.S.)
de Lavergne, V., Abel, E. & Debenedetti, R., 786 (Am.)
—— & Florentin, P., 126 (Lept.)
——, Melnotte, P. & Debenedetti, R., 794, 795 (Dys.)
Law, F. W., 25 (Oph.)
Lawson, G. B., 318 (Z.)
League of Nations, 221 (S.S.)
Leão, A. E. de A., with da Fonseca, 519 *bis* (Der.)
Lebedjeva, M. N., with Kritschewski & Baskin, 578 (Misc.)
Le Bourdellès, B. & Liégeois, R., 212 *bis* (Mal.)
Ledentu, G., 815 (S.S.)
Lee, C. U., with Macgregor, 299 (Z.)
Lee, S., 402 (Dys.)
Lee, Y. S., 785 (Am.)
Lefrou, G., 1, (10), 733 (Pl.)
Le Gac, 438 (Hel.), 500 (Y.F.), 686 (Lep.), 843 (S.S.)
Legendre, F., 580 (Misc.)
Legendre, F. M. A., 644 (Mal.)
Legendre, J., 141 (Fev.), 161, 580, 585 (Misc.), 313, 902 (Z.)
Leger, A., 745 (Rab.)
Leger, M., 458 (Hel.), (600) (Misc.), 855 (Chl.)
Leiper, R. T., 953 (Hel.)
Leitch, J. N., 583 (Misc.), 974 (Hel.), 1032 (B.R.)
—— & Watson, M., 948 (B.R.)
Lenskaya, G. N., with Bezsonova, 738 (Pl.)
Lentz, W. J., with Barnes & Metcalfe, 754 (Rab.)
Leon, R., 711 (Y. & S.)
Leon-Kindberg, with Troisier & Monnerot-Dumaine, 119 (Lept.)
Lépine, P., with Levaditi, Sanchis-Bayarri & Schoen, 283, 285 (Z.)
——, with —— & Schoen, 251 (Rab.)
Leprosy in India, 670, 994 (Lep.)
Leprosy Notes, 327 (Lep.)
Leprosy Review, 327, 668, 994 (Lep.)
Le Roux, J. J. du P., with Cummins, 1005 (Lep.)
Le Roy des Barres, A., 46, 166 (Misc.), 681 (Lep.)
Lesini, with Laffont & Binet, 662 (Mal.)
Lesne, P., 315 (Z.)
Lessertisseur, M., with Dévé, 969 (Hel.)
Lestoquard, F., with Sergent, Edm., Donatien & Parrot, 289 (Z.)
Leupold, F., 231 (S.S.)
Levaditi, C., Anderson, T., Selbie, F. R. & Schoen, R., 695 (R.F.)
——, Lépine, P. & Schoen, R., 251 (Rab.)
——, with Sanchis-Bayarri, V., Lépine, P. & Schoen, R., 283, 285 (Z.)
Levinson, L. B., 244 (S.S.)
—— & Romanowa, K. G., 837 (S.S.)
——, with Roskin, 694 (R.F.)
Lewis, P. A., 871 (Y.F.)
Lewitzki, R. G., with Bogojawlenski, 446 (Hel.)
Li, H. C., 963 (Hel.)
Lie, H. P., 1001 (Lep.)
Liégeois, R., with Le Bourdellès, 212 *bis* (Mal.)
Lifschitz, M., with Herrmann, 650 (Mal.)
Lillie, R. D., 723 (C.Bu.)
Lim, C. E., 944 (Lab.)
Lima, A. da C., 308, (937) (Z.)
——, with Aragão, 483, 870 *bis* (Y.F.)
Limkako, G., with Velasco, Alonso, Fernandez & Del Rosario, 334 (Lep.)
Lincoln, M. C. & Gardner, S. M., 535 (Myc.)
Lindberg, K., 675 (Lep.)
Ling, S. M., 618 (K.A.)
Linton, R. W., 281 (Z.), 853 (S.S.)
Lipscomb, F. M., 156 (Misc.)
Lisbonne, M. & Balmès, 543 (Und.)
Lister, F. S., 367 (Lab.)
Lister, S., 166 (Misc.)
Little, C. J. H., 62 (Misc.)
—— & Bornshin, W., 799 (Dys.)
Liu, H. L., (220) (Mal.)
Liu, K. B., (474) (Hel.)
Liu, P., with Young & Hertig, 94 (K.A.)
Livon, J. & Placidi, L., 748 (Rab.)
Lloyd, L., 846 (S.S.)
——, with Johnson, 811 (S.S.)
—— & Paisley, J. C., 844 (S.S.)
Lloyd, R. B., Napier, L. E. & Mitra, G. C., 619 (K.A.)

Lloyd, R. B. & Paul, S. N., 561 (Misc.)
Lloyd, W., with Sawyer, Kitchen & Frobisher, Jr., 487 (Y.F.)
Locatelli, P., 243 (S.S.)
Lodder, J., with Bonne, 529 (Der.)
Löffler, E. & Schweinburg, F., 751 (Rab.)
Lohfeldt, with Ruge, Knabe, Eisenberg & Kunert, 214 (Mal.)
Lolli, G., 472 (Hel.)
Longo, D., 151 (Fev.)
van Loon, F. H. G., 345 *bis* (Sp.)
Lopes, R. S., 450 (Hel.)
López, J. A., (937) (Z.)
Lopez-Neyra, C. R. & Torres Lopez, A. J., 445 (Hel.)
Lo Presti-Seminerio, F., 98 (K.A.)
Lörincz, F., 444 (Hel.)
Loughnan, W. F. M., 312, 928 (Z.)
Lovell, R., 49 (Misc.)
Low, G. C., 67, 583 (Misc.), 611 (K.A.)
—— & Dixon, D. S., 1024 (Sp.)
Lowman, K. E., 50 (Misc.)
Lubieniecki, H., 983 (Hel.)
de Luca, B., 209 (Mal.)
Luigi, F., 170 (Misc.)
Lujan, M. & Nauck, E., 527 (Der.)
Lumbroso, U., 1011 (Oph.)
Luque, F., with Castellano & Orgaz, 967 (Hel.)
Lusena, M., 541 (Und.)
Luz, A. C., 683 (Lep.)
Lwoff, M., 286 (Z.), 841 (S.S.)
Lynch, F. B. & Callan, A. M., 546 (Und.)

M

Maass, E., 524 (Der.)
M'Aleer, T. B., 716 (Y. & S.)
McAlpine, J. G., Plastridge, W. N. & Brigham, G. D., 550 (Und.)
MacArthur, W. P., 527 (Der.)
——, Dudley, S. F. & Whittingham, H. E., 148, (556) (Fev.)
McCarrison, R., 758 (Bb.)
MacClure, E., with Kuczynski & Hohenadel, 481 *bis*, 482 (Y.F.)
McCoy, O. R., 426 *bis*, 466 (Hel.)
Macdonald, G., with Gordon, 643 (Mal.)
Macdonald, I., (405) (Dys.)
Macfie, J. W. S. & Thomson, J. G., 282 (Z.)
Macgregor, M. E., 297 (Z.)
—— & Lee, C. U., 299 (Z.)
McGuire, C., 515 (Der.)
——, with Acton, 523 (Der.)
McGuire, G., 41 (Misc.)
Machattie, C., with Mills & Chadwick, 620 (K.A.)
McHenry, D. D., 502 (Oph.)
Macht, D. I., 341 (Lep.)
Maciel, H., 449, 455 *bis* (Hel.), 525 (Der.)
McKay, A. C., with Ross, 451 (Hel.)
McKendrick, A. G., 1033 (B.R.)
Mackie, F. P. & Chitre, G. D., 349 (Sp.)
——, Fairley, N. H. & Staff of the Haffkine Institute, 343 (Sp.)
McKinley, E. B., 310 (Z.)
Mackinnon, M., 35 (Misc.)
Maclean, G., 227, 229, 809, 847 (S.S.)
McNabb, J., 387 (Am.), 593 (Misc.)
MacPherson, J., 357 (Z.)
Maczkiewiecz, A., 444 (Hel.)
Madras, 29, 1015 (Oph.), 369 (Lab.)
Maeda, M., 453 (Hel.)
Magath, T. B. & Brown, P. W., 802 (Dys.)
Magovcević-Schneider, D., with Dimitrijević-Speth, (405) (Dys.)
Mahaffy, A. F., with Bauer, 871, 875 (Y.F.)
Maitra, G. C., with Tomb, 14 (Chl.)
Maitra, J. N., 402 (Dys.)
Majumdar, A. R., 96 (K.A.), 788 (Am.)
Makarjin, A. A., 646 (Mal.)
Malandkar, M. A., with Sokhey, 343 (Sp.)
Mallia, G. R., 278 (Z.)
v. Mallinckrodt-Haupt, A., 922 (Z.)
Malone, R. H., 750 (Rab.)
——, with Cunningham, 742 (Rab.)
——, with d'Herelle & Lahiry, 558 *bis* (Misc.), 1026 (B.R.)
Maltzer, M., 691 (R.F.)
Manai, A., 574, 576 (Misc.)
Manalang, C., 172 (Misc.), 304 (Z.), 640 (Mal.)
Manieri, A. & Gori, P., (117) (R.F.)
Mankikar, D. S., with Pandit, George & Natarajan, 917 (Z.)
Manouelian, Y., 700 (R.F.)
Mansell, H. E., 792 (Dys.)
Mansell, R. A., 217, 218 (Mal.), 927 (Z.)
Mansfield-Aders, W., 943 (Lab.)
Manson-Bahr, P. H., 67 (Misc.), 346 *bis* (Sp.), 457, 463 (Hel.)
——, Maybury, L. M. & Martin, P. H., 343 (Sp.)
—— & Tait, C. B. V., 378 (Am.)
—— & Willoughby, H., 1017 (Sp.)
Manteufel, P. & Herzberg, K., 877 (Y.F.)
Manuélidis, 142 (Fev.)
Manuwa, S. L. A., 47 (Misc.)
Maplestone, P. A., 410, 984 (Hel.)
—— & Mukerji, A. K., 419 (Hel.)
Marchoux, E., 194 (Mal.)
—— & Chorine, V., 701 (R.F.)
Marginesu, P., 662 (Mal.)
Margulis, S., 968 (Hel.)
Marie, A. C., 754 (Rab.)
—— & Urbain, A., 255, 745 (Rab.)
Markianos, J., 340 *ter*, 341, 686 *quat.*, 687 (Lep.)
——, with Valtis, 686 (Lep.)
Markowitz, J., with Essex, 932 *bis* (Z.)
Marmoiton, J. E., with Worms, 23 (Oph.)
Marneffe, H., with Labernadie, 441 (Hel.)
Marque, A. M., 752 (Rab.)
Marras, F. M., 9 (Pl.)
Marsh, F., (406) (Dys.)
Marshall, J. F. & Staley, J., 300, 301 (Z.)
Martin, C. de C., 798 (Dys.)
——, with Morison, 558 (Misc.)
Martin, K. A. T., 158 (Misc.)
Martin, P. H., 343 (Sp.), 503 (Oph.)
——, with Manson-Bahr & Maybury, 343 (Sp.)
——, with Newham, 60 (Misc.)
Martin, S. H., 346 (Sp.)
Martini, E., 865 (Y.F.)
Martins, A., 317 (Z.)
Marwits, E. L. & van Steenis, P. B., 386 (Am.)
Marzinowsky, E. I. & Schourenkova, A., 912 (Z.)
Masing, E., 289 (Z.)

Maslow, A. W., 904 (Z.)
Mason, V. R., with Kessel, 800 (Dys.)
Massaitis, I. I., 646 (Mal.)
Massia, G., with Nicolas, 623 (K.A.)
Massias, C., 1008 (Lep.)
Matheson, C., 960 (Hel.)
Matheson, R., 511 (B.R.)
—— & Hinman, E. H., 298, 901 (Z.)
Mathias, P., 960 (Hel.)
Mathis, C. & Baury, A., 529 (Der.)
Mathis, M. S., with Wilson, 708 (Y. & S.)
Matsuno, K., 181 (Mal.)
Matsuoka, K., with Shiba, 799 (Dys.)
Matsushima, R., Taguchi, S., Suenaga, D. & Ohya, O., 206 (Mal.)
da Matta, A. A., 341, (342) (Lep.), 710 (Y. & S.)
Mattlet, with Guerin, 158 (Misc.)
Mattlet, G., 169 (Misc.), 715 (Y. & S.)
Matzinger, W., (993) (Hel.)
Maugeri, F., with Fichera, 550 (Und.)
Mauritius, 369, 944 (Lab.)
Maxwell, J. L., 670 (Lep.)
Maxwell, T. A., 515 (Der.)
——, with Faust, 920 (Z.)
Maybury, L. M., with Manson-Bahr & Martin, 343 (Sp.)
Mayer, M., 618 (K.A.)
Mayer, T. F. G., 671, 996 (Lep.)
Mayerson, H. S., with Scott & Turner, 777 (Pel.)
Mayne, B., 182, 658 (Mal.), 273, 899 (Z.)
Mazza, S., 839, 840 (S.S.)
—— & Bianchi, A. E., 466 (Hel.)
—— & Niño, F., 103 (K.A.)
—— & Parodi, S., 533 (Myc.)
Medeiros, L., 328 (Lep.)
Medulla, C., (148), 151, (554) (Fev.), 329 (Lep.), 456 (Hel.), 783 (Am.)
Megaw, J. W. D., 757 (Bb.)
—— & Hawley, H., 572 (Misc.)
——, with Rogers, 688 (B.R.)
de Meillon, B., 306 (Z.)
Meladse, K., 443 (Hel.)
Meleney, H. E., 71 (Misc.), 779 (Am.)
Melhorn, K. C., 589 (Misc.)
de Mello, E. J., 867 (Y.F.)
de Mello, F., 209 (Mal.)
——, Bràs de Sà, L. J. & d'Arbeu, M., 657 (Mal.)
—— & Fialho, (117) (R.F.)
—— & Rodrigues, A., 518 *bis* (Der.)
de Mello, I. F., 116 (R.F.), 185 (Mal.)
—— & da Cruz, L. J. C. (406) (Dys.)
Melnotte, P., with de Lavergne & Debenedetti, 794, 795 (Dys.)
Mendes, N. O., with de Assis, 397 (Dys.)
Mendioroz, J., 672 (Lep.)
de Mendonça, F. C., with Pacheco, 800 (Dys.)
Menendez, P. E., with Bachman, 981 (Hel.)
Menk, W., 590 (Misc.), 787 (Am.)
Mennonna, G., 456 (Hel.)
Mense, C., 949 (B.R.)
Mesik, P. E., 104 (K.A.)
Mesnard, J., Joyeux, B. & Gaulene, 566 (Misc.)
Mesnil, F., 807 (S.S.)
Messik, R. E., 97 (K.A.)
Messimy, R., 1009 (Lep.)
Metcalfe, A. N., with Barnes & Lentz, 754 (Rab.)
Metzler, 323 (Z.)
Meyer, G. J., Oferlé & Uhry, P., 775 (Pel.)
Meyer, K. F. & Eddie, B., 545, 546 (Und.)
Meyerhof, M., 24 (Oph.)
Michael, J. C. & Seale, E. R., 527 (Der.)
Micheletti, E., 200 (Mal.), 428 (Hel.)
Middleton, A. D., 124 (Lept.)
Mieldazis, J. J., 908 (Z.)
Miguens, J., 715 (Y. & S.)
Millet, A. H., 23 (Oph.)
Millous, P., 553 (Fev.)
Mills, E. A. & Machattie, C., with Chadwick, C. R., 620 (K.A.)
Minamizaki, Y., 408 (Hel.)
Minot, A. S. & Cutler, J. T., 569 (Misc.)
Mirra, G., 409 (Hel.)
Missiroli, A., 219 (Mal.), 289, 892 (Z.)
Mitanaga, K., 123 (Lept.)
Mitchell, J. A., 669 (Lep.), 740 (Pl.)
Mitra, A. C., 66 (Misc.)
Mitra, G. C., with Lloyd & Napier, 619 (K.A.)
Mitsuse, B., 624 (K.A.)
Miyake, M., 856 (Chl.)
Miyamoto, S., 903 (Z.)
Miyao, I., 714, 717 *bis*, 719 (Y. & S.)
——, with Schöbl, 717 (Y. & S.)
——, with —— & Pineda, 682 (Lep.)
Miyasaki, S., (474) (Hel.)
Mochtar, A., 467 (Hel.)
Mohanty, L. N., (342) (Lep.)
Molinelli, E. A. & Royer, M., 340 *bis* (Lep.)
—— & Vaccarezza, A. J., 341, 685, 1002 (Lep.)
Mollow, W., (474), 971 (Hel.)
Molodzova, P. F., with Ignatiev, 320 (Z.)
Monbrun, A., 503 (Oph.)
Monnerot-Dumaine, M., with Troisier & Leon-Kindberg, 119 (Lept.)
Monteiro, J. L., 485, 493, 866, 877, (879) (Y.F.)
—— & Travassos, J., 878 *bis* (Y.F.)
Monteiro, L., 496 (Y.F.)
Montel, M. L. R., 83 (Misc.)
Monteleone, R., 206 (Mal.)
Montpellier, J., 521 (Der.)
de Moor, C. E., 431 (B.R.)
—— & Vedder, A., 694 (R.F.)
Morales-Otero, P. & Hernandez, L. G., 1008 (Lep.)
Morax, V., 22, 23, 1012 (Oph.)
Morenas, 990 (Hel.)
Morenas, L., 889 (Z.), 970, 990 (Hel.)
——, with Cordier, 786 (Am.)
Moretti, G., 974 (Hel.)
Moretti, P., 113 (R.F.)
Morgan, W. B., 154 (Misc.)
Morin, H. G. S., 307 (Z.), 564 (Misc.), 641 (Mal.)
Morishita, K., 185 (Mal.)
Morison, J., 371 (Lab.)
—— ——, Choudhury, B. K. P. & Rahman, H., 855 (Chl.)
—— & Martin, C. de C., 558 (Misc.)
—— & Vardon, A. C., 560 (Misc.)
Moriwaki, G., 794 (Dys.)
Moroder, J., 113 (R.F.)
Moroder Muedra, J., 701 (R.F.)

Morrell, C. A., with Wakeman, 876 (Y.F.)
Moschkowski, S., 218 (Mal.)
Moskwin, I. A., 109 (R.F.)
Motais, F., 964 (Hel.), 1015 (Oph.)
Motta, J., 1001 (Lep.)
Mounier, with Garin & Doubrow, 414, 428 (Hel.)
Mouquet, A., 723 (Y. & S.)
Mtschedlidse, I., 415 (Hel.)
Mu, J., with Hu, 1007 (Lep.)
—— & Huie, D., 97 (K.A.)
Mudschiri, M., 415 (Hel.)
Mugrage, E. R., 745 (Rab.)
Mühlens, P., 404 *bis* (Dys.), 622 (K.A.), 658 (Mal.)
——, with Ruge & zur Verth, 175 (B.R.)
Muir, E., 326, 332, 338, 1000, 1007 (Lep.), 1025 (B.R.)
Mukerjee, S. K., 26, 28 (Oph.)
Mukerji, A. K., with Maplestone, 419 (Hel.)
Mukerji, S., (937) (Z.)
Mukharji, B. C., 710 (Y. & S.)
Mukherjee, B. P., with Chopra, 616 (K.A.)
Muldoon, W. E., 1010 (Oph.)
Muller, H. R., with Noguchi, Tilden & Tyler, 153 *bis* (Fev.)
—— & Tilden, E. B., 478 (Y.F.)
—— & Tyler, J. R., 557 (Fev.)
Mullick, M. N., with Napier, 93 (K.A.)
Munce, T. E., 754 (Rab.)
Muniz, J., with da Cunha, 272, 290 *bis* (Z.), 492 (Y.F.)
Munro, R., (803) (Dys.)
Muraz, G., 814 (S.S.)
Murgatroyd, F., with Yorke & Adams, 237, 804 (S.S.)
Murphy, J. F., with Smith, 753 (Rab.)
Murphy, R. A., 197 (Mal.)
Murray, G. E., 660 (Mal.)
Myers, J. G., 321 (Z.)
Mynssen, G. E. H. V., 786 (Am.)

N

Naidu, B. P. B. & Avari, C. R., 728 (Pl.)
——, with Caius, 734 (Pl.)
—— & Jung, J. S., 6, 728 (Pl.)
——, —— & Kamakaka, K. H., 740 (Pl.)
Naique, R., 61 (Misc.)
Najera, L., with Zschucke, 437 (Hel.), (854) (S.S.)
Nakamura, H. & Shan, C. P., (406) (Dys.)
Nambiar, M. R., with Gloster, Beer & Sastry, 259 (Rab.)
Namikawa, H., 695 (R.F.)
Nanhorya, H. B. D., 25 (Oph.)
Nanta, A., 71 (Misc.)
Napier, E., 91 (K.A.)
Napier, L. E., 615 (K.A.)
—— & Gupta, C. R. D., 607 (K.A.)
—— & Haldar, K. C., 92 (K.A.)
——, with Lloyd & Mitra, 619 (K.A.)
—— & Mullick, M. N., 93 (K.A.)
—— & Sen, G. N., 615 (K.A.)
Nasaretian, L., 773 (Pel.)
Natarajan, N., with King, Iyer & George, 319 (Z.)
——, with Pandit, George & Mankikar, 917 (Z.)
Nativelle, R., 675 (Lep.)
Nauck, E., with Lujan, 527 (Der.)
Nauck, E. G., 412 (Hel.)
——, with Chavarría, 161 (Misc.)
—— & Picado, C., 659 (Mal.), (993) (Hel.)
Naumann, H. E., 787 (Am.)
Nauth, B., 510 (B.R.)
Navarro, A., (220) (Mal.)
Nayar, K. K., with Wright, 27 (Oph.)
Nazmi, M., with Augustine & Helmy, 409 (Hel.)
Neff, E. A., 678 (Lep.)
Neil, J. M., with Ayer, (937) (Z.)
Nepveux, F., with Labbé & Justin-Besançon, 278 (Z.)
Neri, F., (148) (Fev.)
Netherlands Indies Medical & Sanitary Service, 434 (B.R.)
Neveu-Lemaire, E., (474) (Hel.)
Newcomb, C., 765 (Bb.)
—— & Verdon, P., 26 (Oph.)
Newham, H. B. & Martin, P. H., 60 (Misc.)
Newman, B. M., with Barber & Komp, 188 (Mal.)
Newsad, A., 914 (Z.)
Nguyen-van-Khai, 756 *bis* (Bb.)
Nicholas, M. J., with Cunningham & Lahiri, 746 (Rab.)
Nicholls, L., 360 (Z.)
Nicol, W. D., with James & Shute, 181, 183 (Mal.)
Nicolaew, B. P. & Yakowlewa, W. W., 892 (Z.)
Nicolas, Lacassagne & Froment, R., 775 (Pel.)
Nicolas, C., with Lara, 334 (Lep.)
Nicolas, J. & Massia, G., 623 (K.A.)
Nicolau, S. & Kopciowska, L., 251 (Rab.)
Nicolle, C., 556 (Fev.), 1012 (Oph.)
—— & Anderson, 106, 108, 109, 692, 693 (R.F.)
——, —— & Colas-Belcour, J., 107, 692 *bis* (R.F.)
——, —— & Hornus, P., 106 (R.F.)
——, Durand, P. & Conseil, E., 735 (Pl.)
Nicolle, P., with Launoy & Prieur, 231, 834 (S.S.)
Niekerk, J., with Andu, 17 (Chl.)
van Niekerk, J., with Soeleiman, 859 (Chl.)
Nieschulz, O., 899, 903 (Z.)
—— & Wawo-Roentoe, F. K., 577 (Misc.), 707 (Lept.), 848 (S.S.), 891, 924 (Z.)
Nigam, K. S., 74 (Misc.)
Nigeria, 730 (Pl.), 939, 940 *ter* (Lab.), 996 (Lep.)
Niño, F., with Mazza, 103 (K.A.)
Nitsche, O., 286 (Z.)
van Nitsen, R., & Langeron, J., (406) (Dys.)
Nitzulescu, V., 313 *bis* (Z.)
Noda, M., 549 (Und.)
Noguchi, H., Muller, H. R., Tilden, E. B. & Tyler, J. R., 153 *bis* (Fev.)
Nohira, A., 114 *bis* (R.F.)
Nolasco, J. O., 1003 (Lep.)
Nolf, L. O., with Ackert, 469 (Hel.)
No-Lorandos & Pangalos, G., 383 (Am.)
Norgaard, A., with Thaysen, 351 (Sp.)
Nubert, G. & Branisteanu, D., 790 (Am.)
Nunez, P. E., 1023 (Sp.)
Nuttall, G. H. F., with Keilin, 921 (Z.)
Nutter, R. B., 101 (K.A.)

O

Ōba, T., (474) (Hel.)
Obana, K., with Kondo, 749 (Rab.)
O'Brien, A. J. R., 716 (Y. & S.)
O'Brien, C. S., 504 (Oph.)
O'Brien, H. R., 978 (Hel.)
Ochoterena, I., 992 (Hel.)
O'Connor, F. W., 986 (Hel.)
——, Golden, R. & Auchincloss, H., 986 (Hel.)
Oekonomopoulo, N., 145 (Fev.)
von Oettingen, W. F., 957 (Hel.)
—— & Garcia, F., 957 (Hel.)
Oferlé, with Meyer & Uhry, 775 (Pel.)
Office International d'Hygiène Publique, 42, 43 (Misc.)
Ogawa, J., 393 (Am.)
Ohya, O., with Matsushima, Taguchi & Suenaga, 206 (Mal.)
Oiso, T., 428 (Hel.)
Okell, C. C., 877 (Y.F.)
—— & Blake, A. V., 399 (Dys.)
Oleinikow, S. V., 983 (Hel.)
de Oliveira, W., 499 (Y.F.)
Olmer, D. & Olmer, J., 150 (Fev.)
Olmer, J., with Gaston & Amédéo, 393 (Am.)
Olpp, 674 (Lep.)
Ophüls, W., 979 (Hel.)
Oquiñena Echalecu, F., 965 *bis* (Hel.)
Orellana, 755 (Rab.)
Orenstein, A. J., 651 (Mal.)
——, with Fischer, 408 (Hel.)
Orgaz, J., with Castellano & Luque, 967 (Hel.)
Orüshi, N., (406) (Dys.)
Ormond, A. W., 1015 (Oph.)
Ortiz de Landazuri, A., 956 (Hel.)
Oselladore, G., with Fasiani, 534 (Myc.)
Osterberg, A. E., with Goeckerman & Sheard, 529 (Der.)
Ostrowski, B., 612 (K.A.)
Otaka, Y., 8 (Pl.)
Otero, P. M., 541 (Und.)
Otto, G. F., 974 (Hel.)
——, with Cort & Spindler, 973 (Hel.)
Otto, R., 360, 933 (Z.)
Ottolenghi, D. & Brotzu, G., 649 (Mal.)
Ouchakov, V. G., 261 (Rab.)
Ozawa, M., 963 (Hel.)

P

Pacheco, G., (406), 796 (Dys.)
—— & Fialho, A., 404 (Dys.)
—— & de Mendonça, F. C., 800 (Dys.)
—— & Rodrigues, C., 797 (Dys.)
Paine, R. W. & Edwards, F. W., 301 (Z.)
Paisley, J. C., with Connal, Elmes & Bowrey, 9 (Pl.)
——, with Lloyd, 844 (S.S.)
Paldrock, A., 329 (Lep.)
Palevici-Sadogurskaja, M., (406) (Dys.)
Palthe, P. M. v. W., 752 (Rab.)
Pampana, E., 696 (R.F.)
Pampana, E. J., 526 (Der.)
Panayotatou, A., 381 (Am.), 614 (K.A.)
Pandit, C. G., George, P. V., Mankikar, D. S. & Natarajan, N., 917 (Z.)
——, Pandit, S. R. & Iyer, P. V. S., 989 (Hel.)
Pandit, S. R., with Pandit, C. G. & Iyer, 989 (Hel.)
Pangalos, G. C., 99 (K.A.)
——, with Blanc & Joannidès, 1005 (Lep.)
——, with No-Lorandos, 383 (Am.)
Panja, G., 516 (Der.)
Papadopoulo, J., with Petzetakis, 68 (Misc.)
Pappalardo, C., 383 (Am.)
Parodi, S., with Mazza, 533 (Myc.)
Parreiras, D., 495 (Y.F.)
Parrot, L., 103 (K.A.)
——, with Foley, 323 (Z.)
——, with Sergent, Edm., Donatien & Lestoquard, 289 (Z.)
——, with —— & Sergent, Et., 299 (Z.)
——, with Sergent, Et., 312, 323 (Z.)
Parsons, A. L., 218 (Mal.)
Pashitnowa, Z. A., 907 (Z.)
Pastor Botija, F., with Hernandez-Pacheco, 444 (Hel.)
Patel, P. T., 729 (Pl.)
Patton, W. S. & Evans, A. M., 177 (B.R.)
Paul, F., 958 (Hel.)
Paul, S. N., with Lloyd, 561 (Misc.)
Paulson, M. & Andrews, J., 885 (Z.)
Pavlova, P., with Schourenkova & Demina, 913 (Z.)
Pavlovsky, E. N. & others, 951 (B.R.)
Pawlowsky, E. N. & Chodukin, N. J., 323 (Z.)
—— & Stein, A. K., 322, 361 (Z.)
Pecori, G. & Escalar, G., 195 (Mal.)
Peiping Union Medical College, 265 (B.R.)
Peirier, 336, 1003 (Lep.)
Peller, S., 645 (Mal.)
Peltier, M., 456 (Hel.)
—— & Raynal, J., 459 (Hel.)
Peña Chavarria, A., with Barrera, 334 (Lep.)
—— & Shipley, P. G., 518 (Der.)
Penna, O. & de Figueiredo, B., 477, 868 (Y.F.)
Pentschew, A., with Jahnel, 700 (R.F.)
Peon, I. E., 991 (Hel.)
Pereira, J. M., 15 (Chl.)
Perekropoff, G. J., 891 (Z.)
Perez, P., with Dios & Werngren, 842 (S.S.)
Perfiliev, P. P., 313 (Z.)
Pergher, G., with Sanarelli, 120, 121 (Lept.)
Perry, H. M., 463 (Hel.)
Peryassú, A. G., 312, (938) (Z.)
Pessôa, S. B., 408, 448 *bis* (Hel.)
Peter, L. C., 25 (Oph.)
Peterson, J. P. & Ginsburg, J. M., 926 (Z.)
Petrov, V. P., 554 (Fev.)
Pettit, A., Roubaud, E. & Stéfanopoulo, G., 874 (Y.F.)
—— & Stéfanopoulo, G., 488, 489, 875 (Y.F.)
Petzetakis, 67 *bis* (Misc.)
Petzetakis, M., 385 *bis*, 784 (Am.)
—— & Papadopoulo, J., 68 (Misc.)
Peyrot, J., 865 (Y.F.)
Pezzi, G., 1006 (Lep.)
Philip, C. B., 483 *bis* (Y.F.)
——, with Hudson, 489 (Y.F.)
Phipson, E. S., 732 (Pl.)
Phisalix, 933 (Z.)
Photakis, B. A., 142 (Fev.)
Photinos, P., 514 (Der.)
Picado, C., with Nauck, 659 (Mal.), (993) (Hel.)
Pilkington Brothers Ltd., 914 (Z.)

Pillat, A., 22, 504 (Oph.)
—— & King, G., 25 (Oph.)
Pilon, P. J. J. R. T., 22 (Oph.)
Pinard, M., Rabut, Girand & Abricosoff, 341 (Lep.)
Pineda, E. V., Pineda, E. R. & Dayrit, A., 679 (Lep.)
——, with Schöbl & Miyao, 682 (Lep.)
——, with Wade, 326 (Lep.)
Pinto, G. de S., 524 (Der.)
Pirani, A., 251 (Rab.)
Pirie, J. H. H., 465 (Hel.), 738 (Pl.)
——, Retief, F. & Ferguson, A. L., 427 (Hel.)
Pirot, 269 (Z.), 411 (Hel.)
—— & Barrat, 982 (Hel.)
Piva, G., 542 (Und.)
Piza, J. de T. & Gomes, L. de S., 703 (Lept.)
Plá, J. C., Talice, R. V. & Surraco, N. L., 1027 (B.R.)
Placidi, L., with Livon, 748 (Rab.)
Plantureux, E., 262 *bis*, 263 (Rab.)
Plastridge, W. N., with McAlpine & Brigham, 550 (Und.)
Plaut, A. & Vogel, H., 458 (Hel.)
Plotnikov, N. N. & Sertschaninov, L. K., 442 (Hel.)
Pocock, R. I., 49 (Misc.)
Poggi, I., 553 (Fev.), (938) (Z.)
Pollitzer, R., with Wu Lien-Teh, Chia-Swee & Jettmar, 2 (Pl.)
Ponomarev, A. V., with Gantt, 749 (Rab.)
Ponomarew, A. W., with Gantt, 255 (Rab.)
Pons, R., 391 (Am.), (406) (Dys.)
Porter, A. & Heymann, S. C., (938) (Z.)
Porter, W. B. & Rucker, J. E., 1020 (Sp.)
Porto, G., 318 (Z.)
Porto Rico, 216 (Mal.)
Poston, M. A., with Amoss, 135 (Und.)
Potapenko, N. A., 215 (Mal.)
Pottinger, D., 656 (Mal.)
——, with Sinton & Smith, 656 (Mal.)
Poursines, with Boinet & Turriès, 382 (Am.)
Prados y Such, M., 772 (Pel.)
Praetorius, G., 465 (Hel.)
Prates, M. M., 91 (K.A.)
Pratt, T. A. & Frew, H. W. O., 792 (Dys.)
Predtetschenskaja, L. A., with Glusmann & Ssolowjewa, 747 (Rab.)
Price, E. W., 457 (Hel.)
Prieur, M., with Launoy, 833 *bis* (S.S.)
——, with —— & Nicolle, 231 (S.S.)
——, with —— & ——, 834 (S.S.)
Proceedings of the Royal Society of Medicine, 49, 67 (Misc.), 538 (Und.)
Proceedings of the Third Scientific Medical Congress of Middle Asia, 1028 (B.R.)
Public Health Reports, 138 (Fev.), 866 (Y.F.)
Puestow, K. L., 522 (Der.)
Puff, G., 716 (Y. & S.)
Pugh, L. P., 538 (Und.)
Puri, I. M., 308 *bis*, (938) (Z.)
Py, C. & Riveros, M., 1004 (Lep.)

Q

Quaite, W. T., 909 (Z.)
von Querner, F. R., 451 (Hel.)

R

de Raadt, O. L. E., 681 (Lep.)
Rabut, with Pinard, Girand & Abricosoff, 341 (Lep.)
Radocovici, E., with Zotta, 242 *bis* (S.S.)
Raevsky, A. S., 147 (Fev.)
Ragain, 1011 (Oph.)
Ragazzi, C. A., 735 (Pl.)
Rahman, H., with Morison & Choudhury 855 (Chl.)
Rajamoney, P. D., with Gater, 303, 305 (Z.)
Rajcevic, M., 959 (Hel.)
Rambo, V. C., 158 (Misc.)
Ramsay, G. C., 637 *bis* (Mal.)
Ramsay, G. W. St. C., 940 *bis* Lab.), 996 (Lep.)
Ramsine, S., 556 (Fev.)
Ranadive, V. Y., with Kamat, 326 (Lep.)
Ranieri, G., 973 (Hel.)
Rao, G. R., 318 (Z.)
Rao, H. S., 268 (Z.)
Rao, S. S., with Acton, 988 *bis*, 990 (Hel.)
Ratcliffe, H. L., 273, 885, 887, 890 *bis* (Z.)
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Ray, K. S., 510 (B.R.)
Raybaud, A., with Roger, 542 (Und.)
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Raynal, J., 459, 463, (474) (Hel.)
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v. Razgha, A., 244 (S.S.)
Reasoner, M. A., 720 (Y. & S.)
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Reiss, F., 533 (Myc.)
Reitler, R., 646 (Mal.)
Remlinger, P., 744, 745 (Rab.)
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Remontet, J. E., with Vialatte, 573 (Misc.)
Renaud, M., 934 (Z.)
Resolutions passed at the All-India Medical Conference, 510 (B.R.)
Retief, F., with Pirie & Ferguson, 427 (Hel.),
Revista de la Conferencia Sanitaria Nacional. Caracas, (474) (Hel.)
Revue Pratique des Maladies des Pays Chauds, 385 (Am.)
Reynolds, D., 100 (K.A.), 653 (Mal.)
Reynolds, F. H. K., with St. John & Simmons, 552 *bis* (Fev.)
——, with —— & ——, 552 *bis* (Fev.)
Rhodesia, Southern, 916 (Z.)
Richet, C. & Gley, P., 232 (S.S.)
Rico, J. T., 413, 451 (Hel.)
Riegl, R., with Tsykalas, 459 (Hel.)
van Riemsdijk, M., 18 (Chl.)

Riley, W. A., 269 (Z.)
—— & Christenson, R. O., 689 (B.R.)
——, with Cort, Schapiro & Stoll, 440 (Hel.)
——, with ——, Stoll, Sweet & Schapiro, 431 (B.R.)
Riou, with Delpy & Cauvin, 744 (Rab.)
Risquez, F. A., 51 (Misc.)
de Rivas, D., 160 (Misc.)
Rivera, T., with Hoffman, 452 (Hel.)
Riveros, M., with Py, 1004 (Lep.)
Rivnay, E., 921 (Z.)
Robbins, B. H., 450, 981 (Hel.)
——, with Lamson & Ward, 418 (Hel.)
Roberts, S. R., 768 (Pel.)
Robertson, M., 279 (Z.)
Robertson, O. H. & Cheer, S. N., 863 (B.R.)
Robertson, R. L., 438 (Hel.)
Rodenwaldt, E. R. K. & Cohen, A. J., 550 (Und.)
Rodrigues, A., with de Mello, 518 *bis* (Der.)
Rodrigues, C. & Pacheco, 797 (Dys.)
Rodriguez, J., 675 (Lep.)
Rodriguez Lopez-Neyra, C. & Torres Lopez, A. J., 965 (Hel.)
Roegholt, M. N., 155 (Misc.)
Roehl, W., 93 (K.A.)
Roger, H., 542 *ter* (Und.)
—— & Albert-Cremieux, 542 (Und.)
—— & Raybaud, A., 542 (Und.)
Roger-Nataf, with Cuénod, 27 (Oph.)
Rogers, L., 331, 669 *bis* (Lep.)
—— & Megaw, J. W. D., 688 (B.R.)
Rojas, M., 187 (Mal.)
Romanowa, K. G., with Levinson, 837 (S.S.)
Romanowa, K., with Roskin, 233, 837 (S.S.)
Rome, 173 (B.R.)
Romiti, C., 566 (Misc.)
de Rook, H., 985 (Hel.)
Rose, W. J., 129 (R.B.F.), 381 (Am.)
Rosenberg, M., 203 (Mal.)
Rosenfeld, W. D., with Dubrowinski, Kranzfeld & Salamandra, 415, 442 (Hel.)
Rosenthal, F., 238, 240 (S.S.)
Roskin, G., Bichowskaja, A. & Schischliaiewa, S., 837 (S.S.)
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—— & Romanowa, K., 233, 837 (S.S.)
Ross, I. C., 958, 959 (Hel.)
—— & McKay, A. C., 451 (Hel.)
Ross, P., 438 (Hel.)
Ross, R., 634 (Mal.)
Rossow, A. W., 721 (Y. & S.)
Rothermundt, M., 111 (R.F.)
Roubaud, E., 497 (Y.F.), 911 (Z.)
—— & Colas-Belcour, J., 310 (Z.)
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Rouslacroix & Recordier, 151 (Fev.)
Rousseau, 584 (Misc.)
Rousseau, M., 505 (Oph.)
Row, R., 326 (Lep.)
Roy, A. C., with Boyd, 94 (K.A.), 570 (Misc.)
Roy, B. C., 510 (B.R.)
Roy, D. N., with Strickland, 731 (Pl.)
Royer, M., with Molinelli, 340 *bis* (Lep.)
Ruberti-Fiera, E., 167 (Misc.)
Rubinstein, P. L., with Kritschewski, 577 (Misc.)
——, with Tscherikower, 577 (Misc.)
Rubitschung, O., 454 (Hel.)
Ruchadse, N., 306 (Z.), 647 (Mal.)
Rucker, J. E., with Porter, 1020 (Sp.)
Ruge, H., 62 (Misc.), 724 (C.Bu.)
——, Lohfeldt, Knabe, Eisenberg & Kunert, 214 (Mal.)
——, Mühlens, P. & zur Verth, M., 175 (B.R.)
Rukhadze & Blajin, 446 (Hel.)
Russell, A. J. H., 12, 16 (Chl.)
—— & Sundararajan, E. R., 13, (21) (Chl.)
Russell, H. M., 363 (Lab.)
Russian Journal of Tropical Medicine, 138 (Fev.)
Ruys, A. C., 128 (R.B.F.), 702 (Lept.)
Rychener, R. O., with Ellett, 27 (Oph.)
Ryoji, S., 959 (Hel.)

S

de Sá, L. J. B., (600) (Misc.)
Saad, B., 784 (Am.)
Sabbagh, A. K., 623 (K.A.)
——, with Trabaud & Khaiat, 394 (Dys.)
Sacorrafos, (554) (Fev.)
Saenz, A., 125 (Lept.)
Saijo, Y. & Takino, M., 677 (Lep.)
St. John, J. H., Simmons, J. S. & Reynolds, F. H. K., 552 *bis* (Fev.)
——, with —— & ——, 552 *bis* (Fev.)
Sakaraja, E., 417 (Hel.)
Salah El Din, with Khalil, 963 (Hel.)
Salamandra, E. G., with Dubrowinski, Kranzfeld & Rosenfeld, 415, 442 (Hel.)
Salisbury, E. I., 527 (Der.)
Sall, M., with Durieux, 192 (Mal.)
Salvati, 502 (Oph.)
Salvioli, G., (406) (Dys.)
Salzberger, M., 1025 (B.R.)
Sanarelli, G. & Pergher, G., 120, 121 (Lept.)
Sanchis-Bayarri, V., with Levaditi, Lépine & Schoen, 283, 285 (Z.)
Sanders, E. P., with Cleveland, 887 (Z.)
Sandground, J. H., 445, 468 (Hel.)
Sanfilippo, E., with Ascoli, 136 (Und.)
Sankin, S. L., 447 (Hel.)
Sanner, 77 (Misc.)
Santiago, V., 672 (Lep.)
Santillan, P. & West, A. P., 335 (Lep.)
de Santos, I. & ——, 335 (Lep.)
dos Santos, M., 263 (Rab.)
São Paulo, 778 (B.R.)
Sarchi, G., 5 (Pl.)
Sarkar, H., with Sur, (600 *bis*) (Misc.)
Sarkar, S. L., 183 (Mal.)
Sarles, M. P., 422, 423 *bis*, 424, 425 (Hel.)
Sartorius, F., 797 (Dys.)
Sasaki, R., 765 *bis* (Bb.)
Sastry, S. S., with Gloster, Beer, & Nambiar, 259 (Rab.)
Sautet, J., 279 (Z.), 499 (Y.F.), 791 (Am.)
Saverio, C., 962 (Hel.)
Sawadsky, M., 911 (Z.)
Sawyer, W. A. & Frobisher, M., Jr., 494 (Y.F.)
——, Kitchen, S. F., Frobisher, M., Jr. & Lloyd, W., 487 (Y.F.)
Schachmatow, A. P., 446 (Hel.)
Schachsuwarly, M., 274 (Z.)

Schalimov, L. G., with Zawadowsky, 982 (Hel.)
Schapiro, L., 411 (Hel.)
——, with Cort, Riley & Stoll, 440 (Hel.)
——, with —— & Stoll, 421 (Hel.)
——, with ——, ——, Sweet & Riley, 431 (B.R.)
Schapiro, S. L., with Kritschewski, 578 (Misc.)
Scharff, J. W., 180 (Mal.)
Scheepers, I. K. M., 457 (Hel.)
Scheff, G., 242 (S.S.)
Scheidel, H., 277 (Z.)
Scherer, E., 349 (Sp.)
Schern, K., 853 (S.S.)
Schewtschenko, F. I., 614 (K.A.)
Schéwtschénko, P. I., 99 (K.A.)
Schilling, C., 653 (Mal.)
Schilling, V., 429 (B.R.), 473 (Hel.)
Schischliaiewa, S., with Roskin & Bichowskaja, 837 (S.S.)
Schlossman, K., 684 (Lep.)
Schmidt, G. W., with Doerr, 980 (Hel.)
Schnauder, F., 748 (Rab.)
Schnitzer, R. & Silberstein, W., 235 (S.S.)
Schöbl, O., 717 *bis* (Y. & S.)
—— & Miyao, I., 717 (Y. & S.)
——, Pineda, E. V. & Miyao, I., 682 (Lep.)
—— & Tanabe, B., 717 (Y. & S.)
Schoen, R., with Levaditi, Anderson & Selbie, 695 (R.F.)
——, with —— & Lépine, 251 (Rab.)
——, with ——, Sanchis-Bayarri & Lépine, 283, 285 (Z.)
Schoening, H. W., 754 (Rab.)
Schotter, H., 204 (Mal.)
Schourenkova, A. I. & Demina, N. A., 279 (Z.)
——, —— & Pavlova, P., 913 (Z.)
——, with Marzinowsky, 912 (Z.)
Schoute, E., with de Buck & Swellengrebel, 647 (Mal.), 910 (Z.)
——, with Swellengrebel & de Buck, 304 (Z.)
Schreiber, G., 405 (Dys.)
Schrumpf-Pierron, 393 (Am.)
Schubert, J., 796 (Dys.)
Schüffner, W., 702 (Lept.)
—— & Snyders, E. P., 54 (Misc.)
Schüffner, W. A. P., 118 (Lept.)
——, with Dinger, Snijders & Swellengrebel, 485, 486, 869, 870 (Y.F.)
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Schujman, S., with Fidanza & Fernandez, 680 (Lep.)
Schultz, E. W., 561 (Misc.)
Schultz, L. J., 61 (Misc.)
Schulz, R. E., with Skrjabin, Sserbinoff & Smirnoff, 442 (Hel.)
Schumaker, E., 894 (Z.)
——, with Hegner, 273 (Z.)
Schut, J., 734 (Pl.)
Schütze, H. & Hassanein, M. A., 8 (Pl.)
Schuurman, C. J. & Huinink, A. S. B., 582 (Misc.), 893 (Z.)
——, with Walch, 640 *bis* (Mal.)
Schwarz, A. L., with Umidowa, 278 (Z.)
Schweinburg, F., 751 (Rab.)
——, with Löffler, 751 (Rab.)
Schwentker, F. F., 566 (Misc.)
Schwetz, J., 3 (Pl.), 679 (Lep.), 917 (Z.)
—— & Baumann, H., 644 (Mal.)
—— & Fornara, L. 852 (S.S.)
——, —— & Collart, A., 731 (Pl.)
Schwob, R., with Chevallier, 202 (Mal.)
Scordia, F., with Biginelli, 573 (Misc.)
Scott, J. A., 422 *bis* (Hel.)
Scott, L. C., Turner, R. H. & Mayerson, H. S., 777 (Pel.)
Scrinzi, E., with Sepulcri, 908 (Z.)
Seale, E. R., with Michael, 527 (Der.)
Sébenzow, B. M. & Adowa, A. N., 298 (Z.)
Sédan, J., 503, 1012 (Oph.)
Segal, M. & Bloch, J., 207 (Mal.)
Seguin, P., 700 (R.F.)
Seidelin, H., 497 (Y.F.), 592 (Misc.)
Seiffert, W., with Uhlenhuth, 121 (Lept.)
Seki, Y., 257 (Rab.)
Selbie, F. R., with Levaditi, Anderson & Schoen, 695 (R.F.)
Sella, M., (600) (Misc.)
Sellards, A. W., 490, 491 (Y.F.)
Selwyn-Clarke, P. S., 497 (Y.F.)
Sémenoff, G., 448 (Hel.)
Semeraro, A., 724 (C.Bu.)
Sen, G. N., with Napier, 615 (K.A.)
Sen, P. B., with Brahmachari & Banerjea, 613 (K.A.)
Sensenich, R. L., with Giordano, 539 (Und.)
Sepulcri, P., with Scrinzi, E., 908 (Z.)
—— & Vidale, E., 307 (Z.)
Sergent, Edm., 367 (Lab.), 882 (Z.)
——, Donatien, A., Parrot, L. & Lestoquard, F., 289 (Z.)
——, Sergent, Et. & Catanei, A., 893 (Z.)
——, —— & Parrot, L., 299 (Z.)
Sergent, Et. & Parrot, L., 312, 323 (Z.)
——, with Sergent, Edm. & Catanei, 893 (Z.)
——, with —— & Parrot, 299 (Z.)
Serio, F., (220) (Mal.)
Sertschaninov, L. K., with Plotnikov, 442 (Hel.)
Seshadrinathan, N., with Vasudevan, 522 (Der.)
Sezary, A., 681 (Lep.)
——, Dérot, M. & Guédé, M., 336 (Lep.)
Sfameni, M., 386 (Am.)
Shackle, J. W., 348 (Sp.)
Shaha, B., 184 (Mal.)
Shan, C. P., with Nakamura, (406) (Dys.)
Shannon, R. C., 293, 902, 912 (Z.)
——, Burke, A. W. & Davis, N. C., 905 (Z.)
—— & Davis, N. C., 905 (Z.)
——, with ——, 482, 484 *bis* (Y.F.)
Sharp, N. A. D., 991 (Hel.)
Shastid, T. H., 26 (Oph.)
Shattuck, G. C., 570 (Misc.)
Sheard, C., with Goeckerman & Osterberg, 529 (Der.)
Shedrow, A., (803) (Am.)
Shelley, H. M., 226 (S.S.)
Sheplar, A. E., with Heyd, 781 (Am.)
Shevchenko, F. I., 622 (K.A.)
Shiga, K., 339 *bis* (Lep.)
Shiiba, Y. & Matsuoka, K., 799 (Dys.)
Shipley, P. G., with Peña Chavarria, 518 (Der.)
Shircore, J. O., 712 (Y. & S.)
Shiroki, T., 761 (Bb.)
Shortt, H. E., 608 (K. A.)

Shortt, H. E., Craighead, A. C., Smith, R. O. A., d'Silva, H. A. H. & Das, S., 616 (K.A.)
—, —, —, — & Swaminath, C. S., 95, 604 *bis*, 605 (K.A.)
—, Smith, R. O. A., d'Silva, H. A. H. & Swaminath, C. S., 604 (K.A.)
Shoung, A., with Jolly & da Costa, 856 (Chl.)
Shrivastava, D. L., with Hughes, 652 (Mal.)
Shute, P. G., with James & Nicol, 181, 183 (Mal.)
Sicé, A., 226, 819 *bis*, 820, 822, 823, 842 (S.S.)
— & Boisseau, R., 237 (S.S.), 794 (Dys.)
Sikes, E. K., 919 (Z.)
Silberstein, W., with Schnitzer, 235 (S.S.)
da Silva, E. P., 258 (Rab.)
—, with Bettencourt, 457 (Hel.)
Silva, F., 515, 521 (Der.)
d'Silva, H. A. H., with Shortt, Craighead, Smith & Das, 616 (K.A.)
—, with —, Smith & Swaminath, 604 (K.A.)
Silverman, D. N., (803) (Dys.)
Simic, T., (938) (Z.)
Simmons, J. S., 303 (Z.)
—, St. John, J. H. & Reynolds, F. H. K., 552 *bis* (Fev.)
—, with — & —, 552 *bis* (Fev.)
Simons, C., with Lampe, 672 (Lep.)
Sinclair, C. W., 924 (Z.)
Sinderson, H. C., 962 (Hel.)
Sinicco, S., 978 (Hel.)
Sinton, J. A., 183, 184, 189, 656 (Mal.), 898 (Z.)
—, Smith, S. & Pottinger, D., 656 (Mal.)
Sirca, A., 215 (Mal.)
Siro, F. & Ferruccio, C. R., 671 (Lep.)
Sitsen, A. E., 79, 157 (Misc.)
Skrjabin, K. I., Schulz, R. E., Sserbinoff, P. I. & Smirnoff, G. G., 442 (Hel.)
van Slee, W., 986 (Hel.)
Slot, J. A., 703 (Lept.)
Smallwood, R. P., 129 (R.B.F.)
de Smidt, F. P. G., 7 (Pl.)
Smillie, W. G., 992 (Hel.)
Smirnoff, G. G., with Skrjabin, Schulz & Sserbinoff, 442 (Hel.)
Smith, F. F. S., 24 (Oph.)
Smith, F. L., 401 (Dys.)
Smith, J. & Fraser, A. M., 793 (Dys.)
—, with —, 793 (Dys.)
— & Murphy, J. F., 753 (Rab.)
Smith, R. O. A., 324, 898 (Z.)
—, with Shortt, Craighead, d'Silva & Das, 616 (K.A.)
—, with —, d'Silva & Swaminath, 604 (K.A.)
—, with —, Craighead & Swaminath, 95, 604 *bis*, 605 (K.A.)
Smith, S., 207 (Mal.)
—, with Sinton & Pottinger, 656 (Mal.)
Smith, T., 536 (Und.)
Smithies, F., 417 (Hel.)
Smorodinzew, I. A. & Adowa, A. N., 912 *bis* (Z.)
Smyrniotis, P. C., 461 (Hel.)
Snijders, E. P., 384 (Am.), 487 (Y.F.)
—, with Dinger, Schüffner & Swellengrebel, 485, 486, 869, 870 (Y.F.)
Snyders, E. P., with Schüffner, 54 (Misc.)
Sociedad Argentina de Patologia Regional del Norte, 863, 952 (B.R.)
Soeleiman, M. M. & van Niekerk, J., 859 (Chl.)
Soesilo, R., (938) (Z.)
—, with Walch, 909 (Z.)
Soewandi, with Bonne, 895 (Z.)
Sofiev, M. S. & Shevchenko, F. I., 622 (K.A.)
Sofiew, M. S., 924 (Z.)
Sokhey, S. S., 370 (Lab.)
— & Gokhale, S. K., 343 (Sp.)
— & Malandkar, M. A., 343 (Sp.)
Solotnikow, I., 306 (Z.)
Sonnenschein, C., 1007 (Lep.)
Sorel, F., 591 (Misc.)
— & Armstrong, I., (10) (Pl.), 867 (Y.F.)
Sorge, G., (406) (Dys.), 611 (K.A.)
Sorour, M. F., 957 (Hel.)
Soru, E., 859 (Chl.)
Souchard, L., 855 (Chl.)
South Africa, Union of, 40 (Misc.), 669 (Lep.)
South African Institute for Medical Research, 367 (Lab.)
de Souza-Araujo, H. C., 684 (Lep.)
de Souza, M. A., 262 (Rab.)
Sparmann, R., 54 (Misc.)
Speedy, W. D. & Adhikari, A. K., 637 (Mal.)
Spindler, L. A., 965, 972, 975 (Hel.)
—, with Cort & Otto, 973 (Hel.)
Sprehn, C., 984 (Hel.)
Srinivassane, with Labernie, 1009 (Lep.)
Ssavatejev, A., 755 (Rab.)
Ssawatejew, A. I. & Ssidorow, N. W., 253 (Rab.)
Sserbinoff, P. I., with Skrjabin, Schulz & Smirnoff, 442 (Hel.)
Ssidorow, N. W., with Ssawatejew, 253 (Rab.)
Ssinjuschina, M. N., 124 (Lept.)
Ssolowjewa, J. W., with Glusmann & Predtetschenskaja, 747 (Rab.)
Staff of the Haffkine Institute, with Mackie & Fairley, 343 (Sp.)
Stähelin, A., 979 (Hel.)
Staley, J., with Marshall, 300, 301 (Z.)
Stanley, L. L., Garfinkle, F. E. & Goddard, W. P., 794 (Dys.)
Stannus, H. S., 766 (Pel.)
Starr, P., with Holmes, 347 (Sp.)
van Steenis, P. B., 149 (Fev.)
—, with Marwits, 386 (Am.)
Steenson, K. R., with Hetherington, 169 (Misc.)
Stefanopoulo, G., 141 (Fev.)
— & Hosoya, S., 706 (Lept.)
—, with Pettit, 488, 489, 875 (Y.F.)
—, with — & Roubaud, 874 (Y.F.)
Stéhélin, with Brulé, 120 (Lept.)
Stein, A. A., 676 (Lep.)
Stein, A. K., with Pawlowsky, 322, 361 (Z.)
Steinfeld, F., 214, 650 (Mal.)
Stekhoven, J. H. S., Jr., 978 (Hel.)
Stern, F., 721 (Y. & S.)
Steudel, 249 *bis*, 250, 854 *bis* (S.S.)
Stieben, W., (551) (Und.)
Stiles, C. W. & Collins, B. J., 920 (Z.)
Stirbu, A., with Ciuca, Ballif & Vieru, 203 (Mal.)
Stockman, R., 571 (Misc.)

Stoll, N. R., 971 *bis* (Hel.)
——, with Cort & Schapiro, 421 (Hel.)
——, with ——, —— & Riley, 440 (Hel.)
——, with ——, Sweet, Riley & Schapiro, 431 (B.R.)
Stookes, V. A., 897 (Z.)
Stover, N. M., with Stuart, (600) (Misc.)
Strasburger, J. & Thill, O., 119 (Lept.)
Strickland, C., 181, 213 (Mal.), 318 (Z.)
——, with Choudhury, K. L. & others, 666 (Mal.)
—— & Chowdhury, K. L., 903 (Z.)
—— & Roy, D. N., 731 (Pl.)
Struthers, E. B., 91 (K.A.)
Struwe, F., with Grabow, 128 (R.B.F.)
Stuart, E. & Stover, N. M., (600) (Misc.)
Stutzer, M., 19 (Chl.)
Suarez, R. M., (600) (Misc.)
Sudan, 962 (Hel.)
Suenaga, D., with Matsushima, Taguchi & Ohya, 206 (Mal.)
Suk, V., 80 (Misc.)
Sukhavanam, B., (474) (Hel.)
Sumatra, 55 (Misc.)
Sundararajan, E. R., with Russell, 13, (21) (Chl.)
Sur, P., with Iyengar, 205 (Mal.)
Sur, S. N. & Ghosh, B., 190 (Mal.)
—— & Sarkar, H., (600 *bis*) (Misc.)
Sur, T. N., 534 (Myc.)
Surbek, K. E., 184, 205 (Mal.)
Surraco, N. L., with Plá & Talice, 1027 (B.R.)
Suzuki, S., 440 (Hel.)
Swaminath, C. S., with Shortt, Craighead, & Smith, 95, 604 *bis*, 605 (K.A.)
——, with ——, Smith & d'Silva, 604 (K.A.)
Swanidse, D., 443 (Hel.)
Sweeney, M. A., 291 (Z.)
Sweet, W. C., with Cort, Stoll, Riley & Schapiro, 431 (B.R.)
Swellengrebel, N. H., 196 (Mal.), 305, 321 (Z.)
——, de Buck, A. & Schoute, E., 304 (Z.), 647 (Mal.)
——, with —— & ——, 910 (Z.)
——, with Dinger, Schüffner & Snijders, 485, 486, 869, 870 (Y.F.)
—— & Doornbos, W. H., 302 (Z.)
——, with Schüffner & Korteweg, 648 *bis* (Mal.)
Swynnerton, C. F. M., 914, 915 (Z.)
Symes, C. B., 729 (Pl.), 906 (Z.)

T

Taddia, L., 784 (Am.)
Taguchi, S., with Matsushima, Suenaga & Ohya, 206 (Mal.)
Tait, C. B. V., with Manson-Bahr, 378 (Am.)
Takahashi, K., Chuan, L. T., To, Y. C., Tsuchiya, K. & Abiko, A., 9 (Pl.)
Takahashi, S., 960 (Hel.)
Takaya, Y., 256 (Rab.)
Takeda, S., 403 (Dys.)
Takeda, T., 803 (Dys.)
Takino, M., with Saijo, 677 (Lep.)
Talbot, 22, 1012 (Oph.)
Taliaferro, W. H., 430 (B.R.)
—— & Taliaferro, L. G., 288 (Z.)
Talice, R. V., 322, 323 (Z.), 531 (Myc.), 924 (Z.)
——, with Plá & Surraco, 1027 (B.R.)
Tampi, K. R., 326 (Lep.)
Tanabe, B., 717 (Y. & S.)
——, with Schöbl, 717 (Y. & S.)
Tanabe, M. & Chiba, E., 391 (Am.)
Tang, F. F., 1011 (Oph.)
Tanganyika Territory, 366, 914, 915 (Z.), 942 (Lab.)
Tarassow, S., with Epstein, 119 (Lept.)
Tardieu, 69 (Misc.)
Tate, P., 517 (Der.)
Taylor, E. L. & Baylis, H. A., 961 (Hel.)
Taylor, F. H., 311, 898 (Z.)
Taylor, G., 171 (Misc.)
Taylor, K. P. A., 359 (Z.)
Taylor, M. R., (938) (Z.)
Tedeschi, C., 528 (Der.), 607 (K.A.)
Teitge, H., 278 (Z.)
Teixeira, J. C., 477 (Y.F.)
Teodosiu, T., with Ionnesco, 252 (Rab.)
Terdschanian, A., 194 (Mal.)
Than-Trong-Phuoc, with de Langibaudière, 785 (Am.)
Thaysen, T. E. H., 348 (Sp.)
—— & Norgaard, A., 351 (Sp.)
Theiler, M., 872 (Y.F.)
Theodor, O., with Adler, 89 (K.A.)
van Thiel, P. H., 469 (Hel.)
Thiéry, J., 252 (Rab.)
Thill, O., with Strasburger, 119 (Lept.)
Thiroux, 1, (10) (Pl.)
Thiroux, A., 3, 732 (Pl.)
Thiry, U., with Bessemans, 125 (Lept.)
Thomas, J. A., with Williams, 380 (Am.)
Thompson, W. R., 860 (B.R.)
Thomsen, O., 725 (C.Bu.)
Thomson, D. & Thomson, R., 432 (B.R.)
Thomson, J. G., 49 (Misc.)
——, with Macfie, 282 (Z.)
Thonnard-Neumann, 187 (Mal.)
Thornton, C. V., 154 (Misc.)
Tilden, E. B., with Muller, 478 (Y.F.)
——, with Noguchi, Muller & Tyler, 153 *bis* (Fev.)
Timpano, P., (474) (Hel.)
Tiprez, J., with Avinée, 973 (Hel.)
Tirouvanziam, 711 (Y. & S.)
Tisseuil, J., 269 (Z.), 333, 671, 685, 1008 *bis* (Lep.)
Tkeschelaschwili, K. & Tschilingaroff, 104 (K.A.)
To, Y. C., with Takahashi, Chuan, Tsuchiya & Abiko, 9 (Pl.)
Todd, J., 694 (R.F.)
Todd, K. W., 717 (Y. & S.)
Tomb, J. W., 17 (Chl.)
—— & Maitra, G. C., 14 (Chl.)
Tonking, H. D., 445 (Hel.)
Torres, C. M., 477 *bis* (Y.F.)
—— & de Azevedo, A. P., 247 *bis* (S.S.)
Torres, O., with de Araujo, 400 (Dys.)
Torres, S., 749 (Rab.)
Torres Lopez, A. J., with Lopez-Neyra, 445 (Hel.)
——, with Rodriguez Lopez-Neyra, 965 (Hel.)

Torrioli, M., 208 (Mal.)
Tournier, E., 341 (Lep.)
Trabaud, J., 58 (Misc.)
Trabaud, Khaiat, H. & Sabbagh, A., 394 (Dys.)
Tramini, J., 502 (Oph.)
Transactions of the Royal Society of Tropical Medicine & Hygiene, 376, 377 (Lab.)
Tran-van-Manh, with Chesneau, 914 (Z.)
Trapesontzewa, C., 1012 *bis* (Oph.)
Traut, I. I., 320 (Z.)
Traut, I. I. *et al*, 168 (Misc.)
Travassos, J., with Monteiro, 878 *bis* (Y.F.)
Travassos, L., 899 (Z.)
Trensz, F., 911 (Z.)
Tribouillet, P. H., (600) (Misc.)
Trinh-Huu-Loi, with Truong-Dinh-Tri, 185 (Mal.)
Triollet, R., (342) (Lep.)
Tripoli, C. J., 390 (Am.)
——, with Johns, 380 (Am.)
Troise, E., 362 *bis* (Z.)
Troisier, J., Leon-Kindberg & Monnerot-Dumaine, M., 119 (Lept.)
Trolli, 33 (Misc.)
Truong-Dinh-Tri & Trinh-Huu-Loi, 185 (Mal.)
Tscherikower, R. S. & Rubinstein, P. L., 577 (Misc.)
Tschilingaroff, with Tkeschelaschwili, 104 (K.A.)
Tschirejkin, W. C., 695 (R.F.)
Tscholaria, D., 773 (Pel.)
Tsuchiya, K. & Chuan, L. T., 733 (Pl.)
——, with Takahashi, Chuan, To & Abiko, 9 (Pl.)
Tsunashima, Y., 417 (Hel.)
Tsurumi, M., 741 *bis* (Pl.)
Tsykalas & Riegl, R., 459 (Hel.)
Tupa, A., 253 (Rab.)
Turner, R. H., with Jones, 388 (Am.)
——, with Scott & Mayerson, 777 (Pel.)
Turriès, with Boinet & Poursines, 382 (Am.)
Tyler, J. R., with Muller, 557 (Fev.)
——, with Noguchi, Muller & Tilden, 153 *bis* (Fev.)
Tzekhnovitzer, M. & Goldenberg, J., 252, 749 (Rab.)

U

Uhlendorf, E., 157 (Misc.)
Uhlenhuth, P. & Seiffert, W., 121 (Lept.)
Uhry, P., with Meyer & Oferlé, 775 (Pel.)
Ukil, A. C., 19 (Chl.), 402 (Dys.)
—— & Guha Thakurta, S. R., 857 (Chl.)
Ullmann-Apostolon, R. & Apostolon, G., 211 (Mal.)
Umanskaja, R. M., with Belezki, 115 (R.F.)
Umar, M., 92 (K.A.)
Umidowa, S. I. & Schwarz, A. L., 278 (Z.)
United Fruit Company, 52 (Misc.), 186 (Mal.)
Urbain, A., 533 (Myc.)
——, with Marie, 255, 745 (Rab.)
Urchs, O., 790 (Am.)

V

Vaccarezza, A. J., with Molinelli, 341, 685, 1002 (Lep.)
Vadivelu, K., with Hirst, 319 (Z.)
Valenzuela, A. J., 68 (Misc.)
Valtis, J. & Markianos, J., 686 (Lep.)
Van den Branden, F., 228, 230, 831 (S.S.), 388 (Am.)
Vardon, A. C., with Morison, 560 (Misc.)
Vassiliadis, P., with Bruynoghe, 280 (Z.)
Vasudevan, A. & Seshadrinathan, N., 522 (Der.)
Vatchaghandy, S. B., 103 (K.A.)
Vaucel, 826 (S.S.)
Vaz, E., 400 (Dys.)
Vedder, A., with de Moor, 694 (R.F.)
Vegni, R., 134, (137) (Und.)
da Veiga, A., 515 (Der.)
Velasco, F. I., Alonso, J. M., Limkako, G. & Fernandez, G., with Del Rosario, F. T., 334 (Lep.)
Vellard, J., 358, 361 *bis*, 930, 931 (Z.)
—— & de Assis, A., 361 (Z.)
—— & Vianna, M. M., 876 (Y.F.)
Velu, H., Balozet, L. & Zottner, G., 696 (R.F.)
Venturi, L. C., 233 (S.S.)
de Vera, B., 341 (Lep.)
—— & Lara, C. B., 335 (Lep.)
Verbunt, J. A. M., with Brug, Haga & van Joost, 1009 (Lep.)
Vercellana, G., 132 *bis* (Und.)
Verdon, P., with Newcomb, 26 (Oph.)
Verghese, G., 759 (Bb.)
zur Verth, M., with Ruge & Mühlens, 175 (B.R.)
Viala, J., 261 (Rab.)
Vialatte, E. F. C. & Remontet, J. E., 573 (Misc.)
Vianna, M., 261 (Rab.)
——, with Vellard, 876 (Y.F.)
Viar, J., (220) (Mal.)
Vidale, E. & Sepulcri, P., 307 (Z.)
——, with ——, 307 (Z.)
Vieira, F. B., 394 (Dys.)
Vieru, M., with Ciuca, Ballif & Stirbu, 203 (Mal.)
Vigne, Assada & Audier, 101 (K.A.)
Vigne, P., 623 (K.A.), 1009 (Lep.)
—— & Fournier, A., 102 (K.A.)
Villain, G., 662 (Mal.)
—— & Krouch, M., (220) (Mal.)
Villard, H., 28 (Oph.)
Villela, E. L., with Jakob & Fialho, 869 (Y.F.)
Villiger, E., 977 (Hel.)
Vinogradoff, 443 (Hel.)
Vint, F. W., 35 (Misc.)
Visher, J. W., 277 (Z.)
Viswalingam, A., 769 (Pel.)
Vitzthum, H. G., 922 (Z.)
Vogel, H., 955 *bis*, 960 *bis*, 991 (Hel.)
——, with Plaut, 458 (Hel.)
de Vogel, W., 337 (Lep.), 487 (Y.F.)
Volpino, G. & Finocchio, M., 750 (Rab.)
Voskressenski, B., 270 (Z.), 416 *bis* (Hel.)
——, with Zdrodowski, 270 (Z.), 416 (Hel.)
Vrij, M. P., with Boerema, 168 (Misc.)

W

Wade, H. W. & Pineda, E. V., 326 (Lep.)
Wadia, B. K., 1014 (Oph.)
Wainstein, A. B., with Aristowsky, 115 (R.F.)
Wakeman, A. M. & Morrell, C. A., 876 (Y.F.)
Walch, E. W. & Schuurman, C. J., 640 *bis* (Mal.)
—— & Soesilo, R., 909 (Z.)
Walker, E. L., 1007 (Lep.)
Walker, J., 460 (Hel.)
——, with Walravens, 721 (Y. & S.)
Walker, J. H. C., 630 (Mal.)
Walker, W. & Watts, R. C., 401, 799 (Dys.)
Wallace, R. B., 581 (Misc.)
Walravens, P., 192 (Mal.), 828 (S.S.)
—— & Walker, J., 721 (Y. & S.)
van Walsem, G. C., 568 (Misc.)
Wampler, F. J., 655 (Mal.)
Wanless, W. J., (600) (Misc.)
Warasi, W., 662 (Mal.)
Ward, C. B., with Lamson & Brown, 977 (Hel.)
——, with —— & Robbins, 418 (Hel.)
Waring, J. I., 761 (Bb.)
Warner, H. J., 501 (Oph.)
Warner, R. A., 475 (Y.F.)
Warren, S. H., with Charles, 393 (Dys.)
——, with Clayton, 397 (Dys.)
Washburn, B. E., 591 (Misc.)
Wassilieff, A., 917, 918 (Z.)
Wats, R. C., 572 (Misc.)
——, with Walker, 799 (Dys.)
Watson, M., 179, 630, 634 (Mal.), 880 *bis* (Z.)
——, with Leitch, 948 (B.R.)
Watt, J. M., 41 (Misc.)
Watts, R. C., with Walker, 401 (Dys.)
Wawo-Roentoe, F. K., with Nieschulz, 577 (Misc.), 707 (Lept.), 848 (S.S.), 891, 924 (Z.)
Wayson, N. E., 677 (Lep.)
—— & Badger, L. F., 333 (Lep.)
——, —— & Dewar, M. M., 340 (Lep.)
Webb, W. L., 37 (Misc.)
Weber, F. W. A., 967 (Hel.)
Webster, W. J., 321 (Z.)
—— & Chitre, G. D., 731 (Pl.)
Weidemann, M., 1008 (Lep.)
—— & Kaktin, A., 329 (Lep.)
Weindrach, G., 980 (Hel.)
Weiss, A., 321 (Z.)
Weiss, C. & Landron, F., 350 (Sp.)
——, ——, Costa-Mandry, O. & Wilkes-Weiss, D., 353 (Sp.)
—— & Weiss, D. W., 344 (Sp.)
Weiss, E., 115 (R.F.)
Weiss, K., (993) (Hel.)
Wellcome Historical Medical Museum, 864 (B.R.)
Welti, M. H., 721 (Y. & S.)
Werber, E. I., (600) (Misc.)
Werngren, E. T., with Dios & Perez, 842 (S.S.)
West, A. P., with Santillan, 335 (Lep.)
——, with de Santos, 335 (Lep.)
West, C. O. & Curth, W., 525 (Der.)
Wheeler, G. A., with Goldberger, 776 (Pel.)
Wherry, W. B., 684 (Lep.)
Whitaker, E. J., (406) (Dys.)
White, G. F., 427 (Hel.)
—— & Dove, W. E., 426 (Hel.)
White, R. S., 634 (Mal.)
White, S., 182 (Mal.)
Whitmore, E., 187 (Mal.)
Whittingham, H. E., with MacArthur & Dudley, 148, (556) (Fev.)
Wickersham, W. W., 160 (Misc.)
Wigglesworth, V. B., 49 (Misc.), 312, 315, 322, 895, 896 (Z.)
Wigmore, J. B. A., 548 (Und.)
Wilkes-Weiss, D., with Weiss, Landron & Costa-Mandry, 353 (Sp.)
Willett, J. C., 398 (Dys.)
Williams, A. W., 1003 (Lep.)
Williams, F. E., with Fairley, K. D. & Fairley, N. H., 470 (Hel.)
——, with Kellaway, 356 (Z.)
——, with —— & Fairley, 970 (Hel.)
——, with —— & Freeman, 933 (Z.)
Williams, L. H., 165 (Misc.)
—— & Thomas, J. A., 380 (Am.)
Williams, L. L., Jr., (220) (Mal.)
Williamson, K. B., 182 (Mal.)
Willoughby, H., with Manson-Bahr, 1017 (Sp.)
Wilson, C. J., 78 (Misc.)
Wilson, D. E., 228 (S.S.)
Wilson, P. W., 712 (Y. & S.)
—— & Mathis, M. S., 708 (Y. & S.)
Wilson, R. P., 24 (Oph.)
Wilson, W. H., 770, 771 (Pel.)
Winchester, J. W., 167 (Misc.)
Wittgenstein, A., 209 (Mal.)
Wolff, J. W., 149 (Fev.)
——, with Kouwenaar, 707 (Lept.)
Worms, G. & Marmoiton, J. E., 23 (Oph.)
Wright, J. H., 61 (Misc.)
Wright, H. N. & Hirschfelder, A. D., 836 (S.S.)
——, with ——, 234 (S.S.)
Wright, R. E., 25, 29 *bis*, 501, 1015 (Oph.)
Wright, R. E. *et al*, 1013, 1015 (Oph.)
—— & Nayar, K. K., 27 (Oph.)
Wu, H. W., with Hoeppli & Hsü, 176 (B.R.)
Wu Lien-Teh, Pollitzer, R., Chia-Swee & Jettmar, H. M., 2 (Pl.)

Y

Yagouboff, F., 416 (Hel.)
Yakowlewa, W. W., with Nicolaew, 892 (Z.)
Yang, C. S. & Ch'en, K. T., 619 (K.A.)
——, with Keefer & Khaw, 614 (K.A.)
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Compiled by MISS M. H. JAMES.

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